

# The Economic and Social Impacts of Water Trading

## Case studies in the Victorian Murray Valley

**Report for the Rural Industries Research and Development Corporation,  
National Water Commission and Murray–Darling Basin Commission**

by Frontier Economics in association with Tim Cummins and Associates,  
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for Rural Futures, University of New England

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# Foreword

The trading of water, which developed in response to competing pressures on the resource from users and for the environment, emerged during the early 1980s. The intention was to facilitate more efficient use of an increasingly scarce resource by enabling water to move to more productive uses.

An open, robust water market is expected to provide numerous benefits to individuals, communities, the environment, and the economy more broadly. A number of concerns have, however, also been expressed about the economic and social impacts of the water trade.

The objective of this study was to report on the impacts of water trading on individual water entitlement holders, industries and communities in the Victorian Murray Valley and, in doing so, to differentiate between changes that are the result of allowing water to move via trade and those that reflect changes in the economy that have affected the industries and communities in the study regions.

The report provides valuable information for policy makers who are examining the social and economic impacts of water trading on rural communities and industries and whether there might be alternative mechanisms that could be used without imposing major constraints on the propensity for water to trade to its most productive use. It seeks to contribute to understanding the impacts of water trading on all stakeholders across regional economies and communities.

The project was funded jointly by the Rural Industries Research and Development Corporation, the National Water Commission and the Murray–Darling Basin Commission.

As an addition to RIRDC’s diverse range of over 1600 research publications, this report forms part of the Rural People and Learning Systems R&D program, which aims to identify generic cross-sectoral concerns for the rural sector and lead to improved market adjustment, innovation and adoption of research results.

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Any views expressed are those of the authors; they do not necessarily reflect the views of their affiliated organisations, the steering committee, or the funding organisations.

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# The main points

- In order to understand water trading, the permanent and the temporary trades need to be considered together. Both types of trade affect water use in a region, and there is often an offsetting direction in observed temporary and permanent trading.
- Water trading increases the parties' capacity to react to changes in circumstances.
- Water trading is a catalyst for change that would in any case have happened as a consequence of drought, variation in commodity markets and rural adjustment.
- It is difficult to untangle the effects of water trading from the background of drought. Any approach implying that all impacts associated with changes in water use are *attributable to or caused by* water trading would be misleading and unhelpful for policy development.
- There is a clear movement of water from irrigation districts to greenfield sites. This trend is away from existing shared-channel infrastructure and towards direct river pumping—in other words, a move from public (or collectively owned) infrastructure to private infrastructure.
- Trade in permanent entitlements has assisted existing industries such as the wine industry and prompted development of new horticultural ventures in Sunraysia.
- Water trading allows more flexible risk management and farm decision making—including the decision to leave agricultural production.
- Water trading in an agricultural system that has both annual and perennial crops gives farmers greater flexibility in making decisions about their priorities for water use, offers a means of managing risk and cash flow—particularly in dry times—and facilitates business growth and development.
- Water trading can have both positive and negative social and economic effects for the local communities. There is strong community opposition to permanent trading out of a district.
- The social impacts in the regions studied are not merely a temporary phenomenon associated with the introduction of water trading. Rather, they will probably be a permanent feature of regional economies exposed to the rapid shifts, facilitated by water trading, in investment between different types of irrigated agriculture.
- Communities can find change and adjustment difficult. The communities in the case study regions that were exporting water experienced reduced populations and less local spending. Communities in the case study regions importing water experienced increased populations but did not necessarily have the infrastructure and services to accommodate the new arrivals.



# Summary

This report examines changes in the Victorian Murray Valley that could be attributed to water trading. It considers the patterns of water trade and the views of irrigators and community members in three case study regions. In an effort to distinguish these changes from rural change that would in any case have occurred, the report also considers the factors that motivate decisions about trading water.

The report is for people who want to understand how water trading is changing irrigation industries and communities. For policy makers and others with a broad interest, Part One bases its findings on observations in three of the most important water trading regions in the southern Murray–Darling Basin. For those interested in particular regions, each of these regional experiences is described in the case studies that form Part Two of the report.

## Background

Water trading in Australia has developed as a response to ‘the return of scarcity’. Competition from other water users and the environment became apparent in the early 1980s, at the end of a century-long drive to build dams and distribute entitlements to use water for irrigation. With all the easy-to-construct and cost-effective dams in south-eastern Australia already built, increased water harvesting had run its race as a means of enabling new irrigation developments. Implementation of a cap on diversions in 1997 then limited the amount of water available for irrigated agriculture in the Murray–Darling Basin.

Water trading was intended to facilitate more efficient use of an increasingly scarce resource by allowing water to be moved to more productive uses. It was expected that an open and robust water market would provide numerous benefits—to individuals, communities, the environment, and the economy in general. Nonetheless, from the beginning, a number of concerns were expressed about the economic and social impacts of water trading.

## Objectives

This research report examines evidence on the various social and economic impacts of water trading with a view to informing policy debate. It focuses on regions where water trading is most prevalent—the irrigation districts of Goulburn–Murray Water and throughout the Sunraysia region on the Victorian side of the Murray.

The primary objective was to ‘ground truth’ the experience with water trading. In particular, the authors sought to quantify and report on, through detailed case studies, the actual impacts of water trading on individual water entitlement holders, industries and communities in the Murray Valley, in order to test the assumed benefits and perceived concerns arising from the trade.

It is important that individuals, communities and governments are able to differentiate between changes that are the result of allowing the movement of water and those reflecting other changes in the economy that have affected industries and communities. At present it is extremely difficult to isolate the effects of water trading from a background of drought, varying commodity markets and rural adjustment. The extent to which water trading might speed up the rate of change associated with other drivers of change is also poorly understood.

The report provides for policy makers information on the potential to redress any social, economic and financial impacts on local communities without imposing major constraints on the ability for water to be traded to its most productive use. The insights and lessons gained from the study will contribute to the Australian Government’s Raising National Water Standards project to monitor the impacts of interstate water trading—a requirement of the National Water Commission under the National Water Initiative. Although the aim is to inform policy debate, any recommendations relating to water market policy are outside the scope of the report.

## Methods used

Social information was collected through interviews in the selected regions, involving irrigators and the broader community. Thirty-three farmers and 112 other community members participated. The economic information was derived from publicly available material and the authors' own analysis.

The regional case studies are presented as Part Two of this report:

- Sunraysia
- Pyramid–Boort
- Rochester, Central Goulburn and Kerang–Cohuna.

## Results

In order to consider changes that are the result of allowing water to be moved, and those reflecting other changes in the economy that have affected industries and communities, the report examines the following:

- the size and direction of water trading
- the drivers of rural change affecting water use and trading
- the impacts that can be attributed to water trading.

### Size and direction of water trading

In the past decade there has been considerable variation in regional experiences of water trading, in both the size and direction of water trading and the type of water being traded—'permanent' water entitlements or 'temporary' seasonal allocations.

- Initially, from 1995–96 to 2001–02, the dairying areas of Rochester and Central Goulburn and the horticultural region of Sunraysia were all buyers of water entitlements. Water was bought from mixed farming regions such as Pyramid–Boort.

- The dairying area of Kerang–Cohuna was also initially a small buyer of water entitlements, but from 1997–98 increased demand from Sunraysia, coinciding with restricted supply from Pyramid–Boort (because annual trade out was limited to 2 per cent of total entitlements), meant that Kerang–Cohuna became a seller of water entitlements.
- In the three seasons from 2003–04 to 2005–06 Pyramid–Boort and Rochester, Central Goulburn and Kerang–Cohuna sold water entitlements to meet further increases in demand from Sunraysia.
- In aggregate, irrigators in Sunraysia are buying water entitlements and selling temporary allocations. Nonetheless, within the region there has also been trade out of irrigation districts. Private diverters account for virtually all the inward trade.

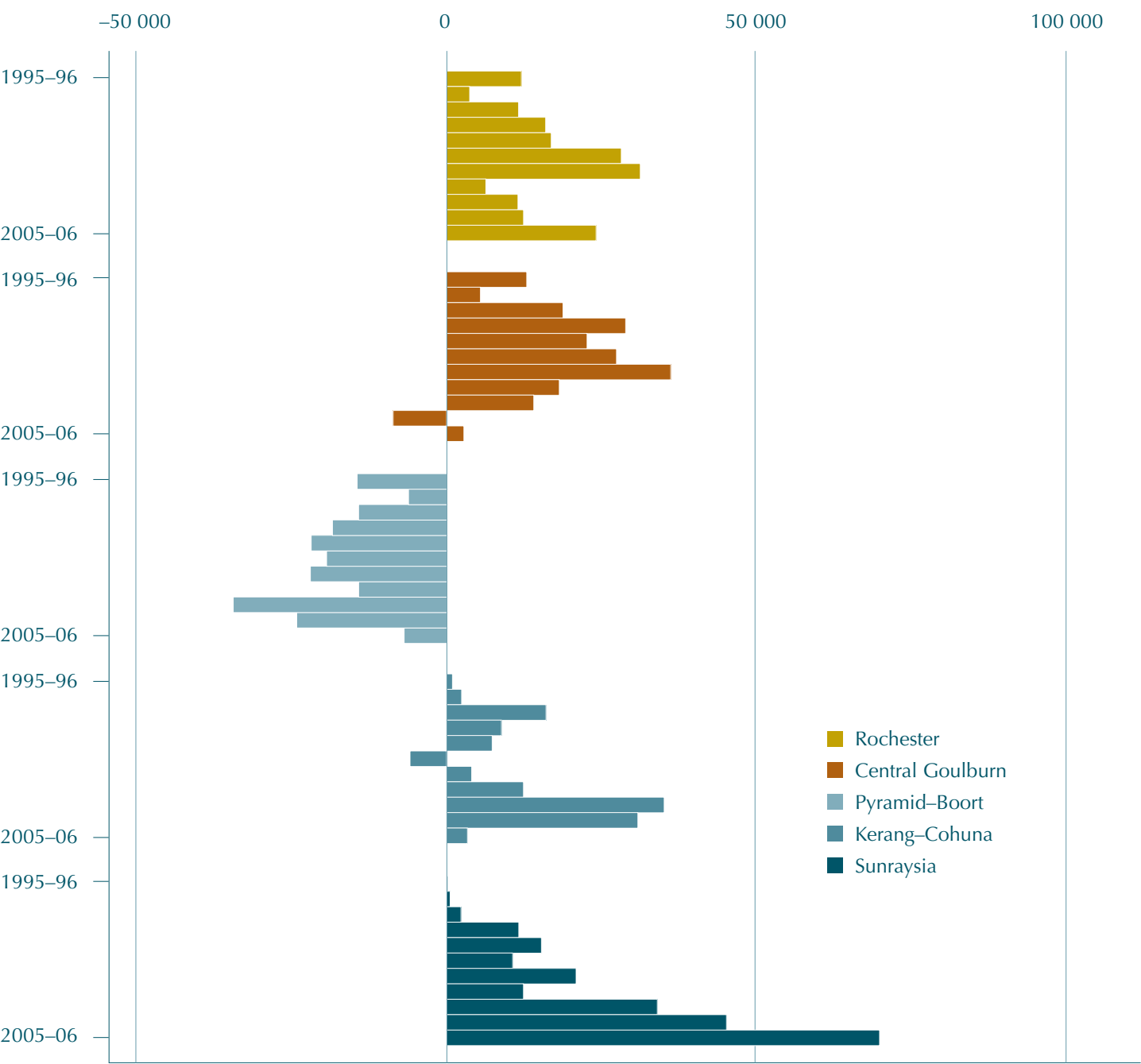
Temporary trade volumes are generally larger than permanent trade volumes. In many regions annual temporary trade volumes outweigh the effect of cumulative permanent trading, and much trade occurs within areas as well as between areas.

A common and noteworthy feature of the regions studied is that there is often an offsetting element in temporary and permanent trading. Many areas made (net) purchases of water allocations while (net) selling water entitlements; other areas were (net) sellers of water allocations while (net) buying water entitlements. The prolonged drought is possibly masking the full implications of this: a return to the seasonal rainfall patterns of the late 20th century might see much more temporary trade into areas such as Pyramid–Boort.

In the future, water that has currently been secured for maturing trees and vines in Sunraysia might not be sold on the temporary market as the water demands of these trees and vines increase.

An important point here is that, to understand the trade, permanent and temporary water trading need to be considered together. Both types of trading affect water use in a region. Irrigators' views on the two types of trading differ greatly.

Total water reallocated through trading, 1995–96 to 2005–06 (ML)



A comparison of total water reallocated through trading for each of the regions shows how the often-offsetting effects of temporary and permanent trading have led to increased water for irrigation use in the Sunraysia and Rochester, Central Goulburn and Kerang–Cohuna regions, while reducing the water used in Pyramid–Boort (see the accompanying figure).

## Drivers of water trading

Water trading in the Victorian Murray Valley follows the postulations of economic theories of trade and investment. The trade increases different parties' capacity to react to changes in circumstances. This report finds that water trading is a catalyst for other drivers of change in rural economies, rather than being, of itself, the primary driver of change.

There are three key drivers of water use and trading:

- the settlement history of irrigation districts
- seasonal water scarcity
- commodity markets and industry pressures.

The history of irrigation districts has implications for current water trading and emerging pressures. Water trading provides a mechanism for adjusting for past decisions in irrigation development that are no longer appropriate—such as irrigation of unproductive land or land less suitable for irrigation or independently irrigating small, separate blocks. In Sunraysia there is a trend away from existing shared-channel infrastructure and towards direct river pumping because greenfield sites offer advantages to horticultural industries, which benefit from new irrigation layouts and economies of scale.

Dry weather has two main effects on water trading. It increases the demand for irrigation water and reduces the water supply. With or without water trading, drought would lead to tough times and many property foreclosures. Water trading delays and prevents some of the sales by giving farmers an additional asset with which to manage debt. Trading out of dairying regions, for example, is a mechanism for clearing some of the debts

accumulated from 2002–03 and, although this is perceived as detrimental to the local community, the alternative mechanism for managing this debt would have arguably been even more detrimental, with impoverished farm families, fire sales of assets and bank foreclosures.

Changes in the economic circumstances of different industries are also key drivers of water trading. Trading in northern Victoria is consistent with commodity prices and prospects. This applies to both permanent and temporary trading. For example, the 1990s saw favourable terms of trade for manufactured dairy products, and the dairy industry expanded accordingly. Trade in water has coincided with major changes in marketing arrangements for irrigated commodities (dried vine fruit and dairying), episodes of severe drought, and responses to taxation and other policy settings. The specific influence of water trading is hard to isolate from these developments. If no trading of water (separate from land) were possible, the investment, employment and regional boom observed in Sunraysia might never have occurred. Future commodity price changes will affect prospects in different industries and the pattern of water trading.

## Regional experiences

- The Sunraysia region has been a large purchaser of water entitlements whilst also selling large volumes of water allocations. Mildura and Robinvale have both been growing rapidly, prompted by the expansion in the horticultural industries in the surrounding districts. Mildura's growth cannot, however, be attributed entirely to the water trade since the growth of regional centres is common throughout rural Australia. Growth places pressure on services and infrastructure in rapidly growing communities; this is especially apparent in Robinvale.
- Pyramid–Boort was the only region studied that has been a net seller of both permanent water entitlements and seasonal water allocations. In Pyramid Hill the loss of water from the district has been associated with the loss of farms and production and the subsequent loss of people and income

for the town. For Boort, this was offset by recreational tourism centred on Little Lake Boort and the development of the olive industry, which provides alternative demands for water in the region.

- Rochester was a purchaser of water entitlements in the late 1990s and early 2000s but sold large volumes of permanent water in 2003–04 to 2005–06. Water use in the area has not changed dramatically because recent sales of water entitlements have been offset by purchases of water allocations from other areas. Irrigation in the area is predominantly for dairy farming. The community of Rochester is under great pressure from the very low seasonal allocations in 2002–03 (57 per cent of entitlements) and 2005–06 (23 per cent) as well as the trend to farm amalgamation.

Until the past three irrigation seasons Central Goulburn had bought and sold small (net) volumes of water entitlements. From 2003–04 to 2005–06 larger volumes of water entitlements were traded out of the area. Many dairy farms in the area were geared towards using more than 100 per cent of water allocations when sales water was available. Lower allocations in recent years have therefore meant buying water on the temporary market, supplementing feed or reducing production. The residents of Kyabram and Tatura were aware of the effect of the water trade on their communities, but they were more concerned about the impact of drought and the loss of young people, who leave for better education and career prospects and rarely return.

Since the late 1990s Kerang–Cohuna has consistently sold water entitlements and purchased water allocations. The combination of dairying and mixed farming allows for diversification between irrigation and dryland agriculture. The communities of Kerang and Cohuna fear that the current water trading trends will mean the eventual closure of the ageing irrigation infrastructure in the area.

## Findings

Separating the effects of water trading from other causes of rural change requires a counterfactual: how would decision making and outcomes in the various regions be different in the absence of water trading?

### Economic impacts

It is difficult to untangle the effects of water trading from the background of drought but, by considering observed outcomes and possible actions in the absence of such trading, the authors found the following:

- Without temporary trade the dairy industry would have fared much worse than it did during the past 10 years of drought.
- Even with temporary trading many dairy enterprises collapsed as a result of the extraordinarily low seasonal allocations of 2002–03 and 2006–07. Permanent trading meant that those farmers left farming with more money than they otherwise would have had.
- Without temporary trading many existing horticultural enterprises in the Goulburn system would not have survived the extraordinarily low seasonal allocations.
- Many mixed farms survived the low seasonal allocations by selling water on the temporary market, thus making more money than they would have done by growing crops.
- In the absence of drought—when high seasonal allocations would be expected—temporary trading into regions such as Pyramid–Boort could be expected to be higher.

It is also difficult to separate the effects of water trading from the background of structural adjustment, but the authors nevertheless found the following:

- Water is being permanently traded out of closer settlement areas with small farms—such as Mildura in Sunraysia and Tongala in the Central Goulburn area.

- Because of the advantages of developing greenfield sites and the difficulty of achieving economies of scale as a result of the small block sizes in some irrigation districts, new developments mainly occur outside constituted irrigation districts.
- Without permanent trading there would have been very little large-scale horticultural development in Victoria in the past 10 years.

Similarly, while it is difficult to untangle the effects of trade from the background of commodity markets, the authors found the following:

- Without permanent water trading the wine boom would have been confined to existing irrigators switching away from dried fruit to wine grapes, rather than the extensive plantings of wine grapes that have occurred.
- The almond boom might not have taken place, since that is an industry heavily reliant on economies of size.
- Less water will be available for temporary trading back into dairy areas as current plantings of vines and trees mature.
- Changes in the relative prices of commodities are likely to alter the patterns of trade.

## Social impacts

Water trading can have both positive and negative effects on local communities:

- There is widespread, vehement community opposition to permanent trading out of a district. Some farmers have been ostracised by their community for selling their permanent water entitlements. With persistent drought, though, there is a greater appreciation that many individuals might be selling unwillingly.
- Most of the people interviewed were strongly supportive of the principles and practice of temporary water trading.
- Water trading has imposed greater management challenges for irrigators in industries where price and marketing risks were previously regulated and production risks were managed by conservatively run irrigation systems.
- Social impacts in the regions studied are not simply a temporary phenomenon associated with the introduction of water trading. Rather, they are likely to be a permanent feature of regional economies exposed to the rapid shifts—facilitated by water trading—in investment between different types of irrigated agriculture.
- Although water trading by entitlement holders is voluntary, the trade also affects third parties. Trade into a region can lead to increased competition in production, queuing for timely irrigation water delivery, and higher water tables. Trade out of a region can lead to increased water delivery charges to remaining users (because of stranded assets), the build-up of disease and pest plants and animals, and depopulation.
- Change and adjustment can be difficult. Communities in regions exporting water can experience reduced populations and less spending. Communities in regions importing water can experience increased populations without necessarily having the infrastructure and services to properly accommodate these new arrivals.
- Service industries—such as agricultural services, farm supplies, and machinery sales and service—that supply inputs to irrigated industries are affected by the growth and contraction of irrigated industries through the water trade. Not only does demand in these industries depend on whether water is moving into or out of a region; it also depends on the types of farms between which water is moving.

## Conclusions

- In broad terms, water trading in the Victorian Murray Valley follows the postulations of economic theories of trade and investment. Similarly, the economic and social impacts identified through this study are generally consistent with what would be predicted from rural sociology theory relating to communities exposed to rapid structural change associated with boom-and-bust cycles in agriculture.
- To understand the water trade, it is necessary to consider permanent and temporary water trading together. Both types of trading affect water use in a region, and there is often an offsetting direction in observed temporary and permanent trading.
- Water trading prompts change that would in any case have happened as a consequence of other forces for change in rural economies—such as drought, varying commodity prices and rural adjustment—rather than being, of itself, the primary force for change.
- It is difficult to untangle the effects of the water trade from the background of drought. Any approach implying that all impacts associated with changes in water use facilitated by trading are *attributable to* or *caused by* trading would be misleading and unhelpful for policy development.
- Future changes in commodity prices will affect prospects in different industries and the pattern of water trade.

## Recommendation

When considering the impacts of water trading, it is important to take into account both temporary and permanent trading and to acknowledge the context of the observed changes in water use—which is a context of rural change and structural adjustment. Any approach implying that all impacts associated with changes in water use facilitated by trading are *attributable to* or *caused by* trading would be misleading and unhelpful for policy development.







## Part One

# The economic and social impacts of water trading



# 1. Introduction

Frontier Economics, in association with Tim Cummins and Associates, Dr Alistair Watson, and Dr Elaine Barclay and Dr Ian Reeve of the Institute for Rural Futures at the University of New England, was commissioned to research the impact of water trading on individual water entitlement holders, industries and communities along the Murray River.

This report examines evidence on the various social and economic impacts of water trading, with a view to informing policy debate. It focuses on regions where water trading is most prevalent—the irrigation districts of Goulburn–Murray Water and Lower Murray Water on the Victorian side of the Murray. The insights and lessons gained from the study will contribute to the Australian Government’s Raising National Water Standards project to monitor the impacts of interstate water trading—a requirement of the National Water Commission under the National Water Initiative.

The primary objective of the project was to ‘ground truth’ the experience with water trading. In particular, the consultants sought to quantify and report on, through detailed case studies, the actual impacts of water trading on individual water entitlement holders, industries and communities in the Murray Valley, in order to test the assumed benefits and perceived concerns arising from the trade.

Information was collected through a series of interviews in the case study regions, involving irrigators and the broader community. (The approach to the fieldwork is described in

detail in Appendix A.) The experiences of these regions and communities are separately documented in the regional case studies that form Part Two of this report. The regions examined were:

- Sunraysia—including Mildura, Merbein, Robinvale, Red Cliffs and river diverters
- Pyramid–Boort
- Rochester, Central Goulburn and Kerang–Cohuna.

## Water trading: assumed benefits and perceived impacts

The broad objective of allowing water to be traded is to maximise the value of scarce water resources by enabling their transfer to the most productive environmental or consumptive use. Economic theory suggests water trading will reallocate water to these ‘higher value’ uses. A market allows water to be bought and sold and hence reallocated between competing uses:

*Trading can reveal the opportunity cost of water to the community—that is, the benefit forgone by not using water in its best alternative use—and, through mutually beneficial trades, facilitate the movement of water to regions and for uses where it is most highly valued. (Productivity Commission 2006, p. 68)*

The following are some of the economic, environmental and social benefits that might accrue at the individual, regional and national levels from water trading:

- increasing community awareness of water as a scarce resource that can be transferred to its most productive consumptive or environmental use by trading
- providing regional development opportunities through the transfer of water from low-value to high-value use, with economic and job growth in rural communities
- providing a financial incentive for achievement of efficiencies in water use
- allowing new investors to acquire water without jeopardising the jurisdiction's responsibility for adherence to sustainable environmental flow regimes and associated caps on consumptive use
- allowing vegetables, rice, cotton and other annual crops to use surplus water allocations from permanent plantings that are expected to be available in normal years
- reducing environmental pressure—for example, by transferring water away from areas of high leakage to areas where more sustainable production can be achieved
- gaining fuller advantage of the physical interconnections in the river and delivery systems. The potential benefits of trade in these interconnected systems extend to more efficient production and use of water for irrigation, the environment and electricity
- allowing business to enter the market to manage risks to shared resources and overcome expected declines in security as previously 'sleeper and dozer' licences are activated or in the face of climate change
- allowing more efficient consumptive use of water without further impacts on environmental flows or ground water-dependent ecosystems
- allowing landholders seeking to retire, restructure or leave agriculture to realise the full value of their assets.

Concerns have, however, been expressed about various impacts of water trading. In particular, there is concern that those involved in water transactions might fail to consider broader impacts on third parties and the community generally. Prominent here is concern about the potentially adverse impacts on regions if water is traded out to other regions. The following are other perceived negatives:

- While the ability to sell water entitlements provides an automatic adjustment mechanism for individual farmers, the sale of water outside a region can affect others in the region. The costs of maintaining existing water infrastructure can fall on fewer remaining users, making it more difficult for them to remain viable—the 'stranded assets' problem.
- Contraction of irrigated agriculture in a region will have a flow-on effect to various support industries in the region, which do not have water entitlements as a compensating benefit.
- Water trading has the potential to cause adverse environmental impacts.
- There have been suggestions that the activities of 'water barons' or 'speculators' may lead to inequitable market outcomes.

There are also different perceptions of the benefits and costs in relation to temporary and permanent trading—see Appendix B.

These concerns underpinned the gradual and partial introduction of water trading and the imposition of various restrictions on the trade in order to allay the concerns. For example, there is an annual interim threshold limit on the level of permanent trade out of irrigation districts of 4 per cent of the total water access entitlement for the irrigation district.<sup>1</sup> The National Water Initiative seeks the removal of barriers to trade but in an orderly fashion, so as to allow the market to develop and to understand the impacts.

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<sup>1</sup> It is agreed under the National Water Initiative that the impact of trade under the interim threshold will be reviewed in 2009, with a view to raising the threshold to a higher level if that is considered appropriate and a move to full and open trade by 2014.

## Framework for analysis

This study looks at the impacts of water trading by comparing observed data with the way individual decisions would have been made and regions would have been developed in the absence of the trade. Defining and measuring the impacts of water trading require the definition of a counterfactual case—the situation that would occur in the absence of water trading.<sup>2</sup>

Defining a counterfactual is important in order to establish those changes that are the result of permitting water to move by means of trading and those that are the consequence of other micro and macro changes in the economy that have affected industries and communities in the study regions. Water trading is not the only change that has occurred on the Victorian side of the Murray River since permanent trading began in 1991. There are probably numerous factors that prompt changes in patterns of water use—movements in commodity prices, wet and dry years, and so on. An important point here is that approaches implying that all impacts associated with changes in water use facilitated by trading are *attributable to* or *caused by* trading would be misleading and unhelpful for policy development.

## The report's structure

The remainder of this report has the following structure:

- Chapter 2 examines the size and direction of water trades in the study regions.
- Chapter 3 identifies the key factors that have driven, and are currently driving, temporary and permanent water trading.
- Chapter 4 discusses the impacts of water trading on individual entitlement holders, industries and communities.
- Chapter 5 presents the findings and conclusions resulting from this research.
- Part Two presents the detail of the three regional case studies—Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna.
- Three appendixes discuss the consultation methodology used in the fieldwork and the outcomes of the consultations—in particular, attitudes to and perceptions of the water trade—and provide a brief history of water trading in Victoria.

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<sup>2</sup> Water trading encompasses the trading of water entitlements either together with or separate from land and takes in all forms of transactions—permanent, temporary, intrastate and interstate, leasing and other transactions.





## 2. Patterns of water trade

The study focuses on the experience of water trading in three case study regions in Victoria—Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna. This chapter briefly describes the case study regions and the broader irrigation systems within which they sit. It also provides an overview of water trading at the aggregate system level and summarises and compares the patterns of water trading in the case study regions.<sup>3</sup>

Such information quantifies a direct effect of water trading, since water is bought and sold between regions in response to the way water was initially allocated between regions and also in response to changes that affect decisions about water use. If no water trade were possible, no reallocation of the water resource between districts could occur.

### The case study regions

Victoria has several irrigation areas. The largest of them, by volume of irrigation water delivered, is the area served by Goulburn–Murray Water, which itself contains numerous regions (see Figure 2.1). There are three systems in the area serviced by Goulburn–Murray Water:

- The Goulburn system—feeding off the Goulburn River, with storage at Lake Eildon—contains the districts of Shepparton, Central Goulburn, Rochester, Pyramid–Boort, Broken River, Goulburn River and Loddon River.
- The Campaspe system—feeding off the Campaspe River, with storage at Lake Eppalock—consists of the Campaspe district and Campaspe River pumpers.
- The Murray system—which draws water from the Murray River, with storages at Hume and ultimately at the Snowy headwaters, and includes the area from the Torrumbarry Weir to Nyah—contains the districts of Murray Valley, Kerang–Cohuna, Swan Hill, Tresco, Nyah, Woorinen, Upper Murray, Mitta Mitta River, Kiewa River, Ovens River and Murray River.

The Sunraysia district and private diverters between Nyah and the border with South Australia are serviced by Lower Murray Water and draw on water from the Murray River.

### Sunraysia

The Sunraysia Irrigation District is bounded by the Murray River from Nyah to the South Australian border, a river distance of about 770 kilometres. Lower Murray Water and the First Mildura Irrigation Trust pump river-quality water for irrigation and domestic and stock supplies and provide a subsurface drainage service to about 3600 customers in the region. This

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<sup>3</sup> The water trading experience for each of the case study regions is examined in detail in the case studies that form Part Two of this report.

**Figure 2.1 Goulburn–Murray Water irrigation districts**



Source: Goulburn–Murray Water.

is a horticultural region, although there is dryland cropping in outlying areas. Mildura is the main regional centre; other townships of note are Red Cliffs, Merbein and Robinvale.

### Pyramid–Boort

The Pyramid–Boort Irrigation District covers 166 215 hectares, of which 126 400 hectares are suitable for irrigation. Among the townships in the area are Tandarra, Dingee, Calivil, Bears Lagoon, Durham Ox, Boort, Pyramid Hill and Macorna.

The Loddon River flows through the area, and Goulburn–Murray Water supplies the Pyramid–Boort Irrigation District by gravity-fed channel water from Lake Eildon via the Waranga Western Channel. About 1250 properties are serviced in the area through a network of 150 kilometres of natural waterways and 1391 kilometres of constructed distribution channels. Water entitlements in the area total 234 729 megalitres (Goulburn–Murray Water 2006b).

### Rochester, Central Goulburn and Kerang–Cohuna

The Rochester–Campaspe irrigation system provides water to 1290 customers via the Goulburn, Murray and Campaspe Rivers and some 664 kilometres of distribution channels and 476 kilometres of drains. The main sources of water supply are Lakes Eildon and Eppalock; supplementary supplies are taken from Greens Lake. Water entitlements in the area amount to 187 396 megalitres in the Rochester area and 20 202 megalitres in the Campaspe Irrigation District. The Rochester Irrigation District covers an area of 107 750 hectares, of which 61 700 hectares are irrigated; the Campaspe Irrigation District covers 9300 hectares, of which 5010 hectares are irrigated.

The Waranga–Mallee Channel, built in the early 1900s, runs 480 kilometres from the Waranga Basin, near Rushworth, to the Eastern Mallee area west of Boort. The Campaspe Syphon takes the Waranga–Mallee Channel under the Campaspe River through three 90-metre concrete pipes (Rochester.org 2007).

The Central Goulburn Irrigation District covers 173 053 hectares, of which 113 106 hectares are irrigated, and is one of the largest irrigated areas in northern Victoria. It extends south and westwards from the Goulburn River and includes the towns of Ardmona, Echuca Village, Girgarre, Kyabram, Lancaster, Merrigum, Mooroopna, Murchison, Stanhope, Tatura, Tongala, Undera and Wyuna. More than 2800 irrigated holdings are serviced by an extensive network of 1460 kilometres of distribution channels and 882 kilometres of drains. Water rights in the area total 385 000 megalitres, supplied mainly from Lake Eildon, which has a capacity of 3 390 000 megalitres (Goulburn–Murray Water 2006b).

Kerang–Cohuna is in the Torrumbarry Irrigation District, which extends along the River Murray from Gunbower in the east to Nyah in the west and southwards to include the town of Swan Hill. It covers 167 000 hectares, of which 150 000 hectares are suitable for irrigation. The irrigation system supplies about 2650 irrigation customers and a further 600 domestic and stock customers. Water for the area is released into the Murray River at Hume Dam. Water from Dartmouth Dam, on the Mitta Mitta River, provides supplementary storage for Lake Hume.



# Trading at the system level

Although specific regions are the focus of this study, patterns of water trade in these regions must be seen in the context of the broader systems that these regions—together with other regions not the focus of this study—comprise. This takes in a broader set of water trading markets.

To encompass all buyers and sellers of water allocations and entitlements in the southern Murray–Darling Basin, it would be necessary to include irrigators in New South Wales, South Australia and elsewhere in Victoria. However, while interstate water trade is still relatively limited and Victorian trade is most prominent in regions serviced by Goulburn–Murray Water and Lower Murray Water, the four systems of these irrigation authorities give a complete story. Water trading in the areas covered by Goulburn–Murray Water and Lower Murray Water relative to those serviced by other rural water authorities is discussed in Appendix C, as part of a brief history of water trading in Victoria.

Figures 2.2 to 2.5 show the temporary and permanent trades of water that have occurred in the four main irrigation systems of Victoria. In addition, they provide a cumulative measure of permanent trades—representing the total change in the volume of entitlements held in the system—and an indication of the total available water that has been reallocated through trade, as follows:

Total available water reallocated through trade

=

Change in available water allocations via trade in entitlements

+

Change in available water via temporary trade in allocations that year

=

Total cumulative change in entitlements

x

Maximum allocation announcement in the system that year

+

Change in available water via temporary trade in allocations that year

The volume of interstate trading is still relatively small, so the net transfer of water from the aggregate of these systems is small.

## The Goulburn system

Temporary transfers of water into and out of the Goulburn system were small until 1999–2000. From 2000–01 to 2002–03 there were net transfers into the system of more than 20 000 megalitres. This was followed by net transfers out of the system in 2003–04 and 2004–05, but 2005–06 saw a return to the system being a net purchaser of temporary water, with a net inflow via temporary trading of more than 50 000 megalitres (see Figure 2.2).

The net transfers of permanent water entitlements have been largely the reverse of the observed net transfers of temporary water: there were permanent net transfers out of the system in 2001–02 and 2005–06. There were also net transfers of permanent water out of the system in 2003–04 and 2004–05. Three consecutive years of approximately 20 000 megalitres a year of permanent trading out of the system have meant that the slight cumulative trend of water out of the system until 2002–03 was greatly amplified by the end of the 2005–06, with 70 000 megalitres of entitlement being traded out. In 2005–06, 1 156 463 megalitres of entitlement were held in the system (Goulburn–Murray Water 2006a). This cumulative permanent trade thus represents 6 per cent of total entitlement.

Generally, the temporary trade flows have determined the total volume of water reallocated through trade. The large amount of temporary trading into the system in 2005–06 was outweighed by the cumulative trade of permanent water out of the system from 1995–96 to 2005–06, meaning that the volume of water available in the system in 2005–06 was less than the volume before trading began.

### The Campaspe system

The Campaspe system has predominantly traded water in temporary markets. Only in 2005–06 were there significant net transfers of permanent water: about 800 megalitres of entitlements were traded out of the system (see Figure 2.3). The largest net transfers out of the system occurred in the three irrigation seasons from 2000–01 to 2002–03. The 2004–05 and 2005–06 irrigation seasons saw temporary water trading bring over 1000 megalitres into the system, enough to outweigh the permanent trading out of the system such that the total water reallocated through trade in 2005–06 was positive.

### The Murray River system above Nyah

In the Murray River system of the area serviced by Goulburn–Murray Water large volumes of water have been traded in temporary markets. Over 50 000 megalitres were transferred into the system in 2003–04 and 2004–05, and over 20 000 megalitres were transferred in 1997–98 and 2005–06. Nearly 10 000 megalitres were transferred in 1998–99 and 2002–03, while net transfers out occurred in 1995–96 and 2000–01 (see Figure 2.4).

For permanent trading, entitlement volumes have consistently been leaving the system—about 5000 to 10 000 megalitres every year from 1998–99 to 2005–06. This is picked up by the representation of cumulative permanent water trade as a relatively steady negative slope, with a total of about 55 000 megalitres being permanently traded out of the system since 1995–96. In 2005–06, 1 132 505 megalitres of entitlement were held in the system (Goulburn–Murray Water 2006a). This cumulative permanent trade thus represents 5 per cent of total entitlements.

The very large temporary trades into the system in 2003–04 and 2004–05 outweigh the accumulation of permanent outflows and so increased the availability of water (compared with a ‘without trading’ scenario) in these years. Nevertheless, the effect of permanent trading taking water out of the system dominates in all the other years since the trend of trading out entitlements began in 1998–99.

### The Lower Murray River system: Sunraysia

The Lower Murray River system (Sunraysia), serviced by Lower Murray Water, has experienced trends that differ greatly from those in the systems of Goulburn–Murray Water: temporary trading has been resulting in net transfers out of the system, and permanent trading has been transferring water entitlements into the system (see Figure 2.5).

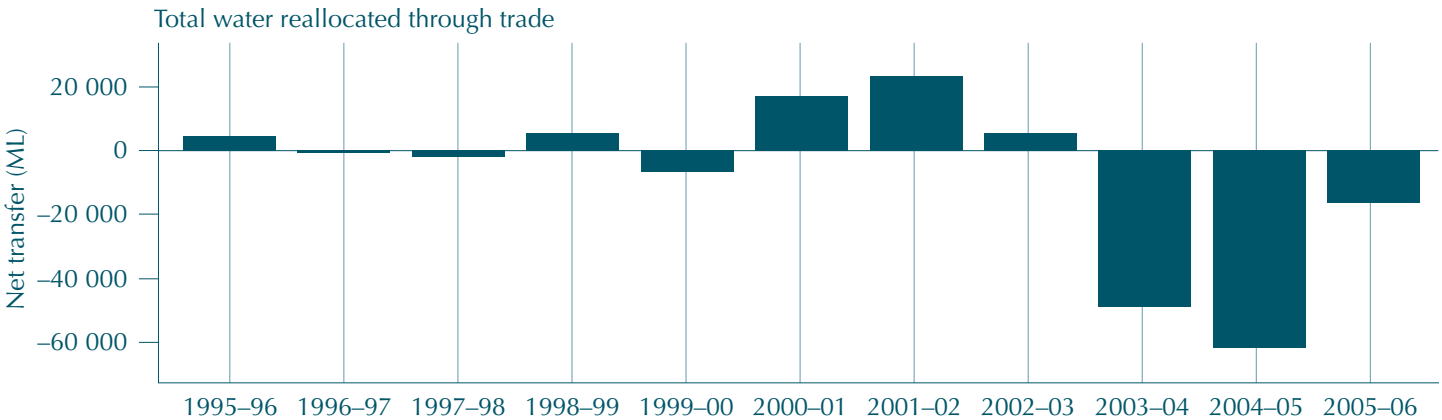
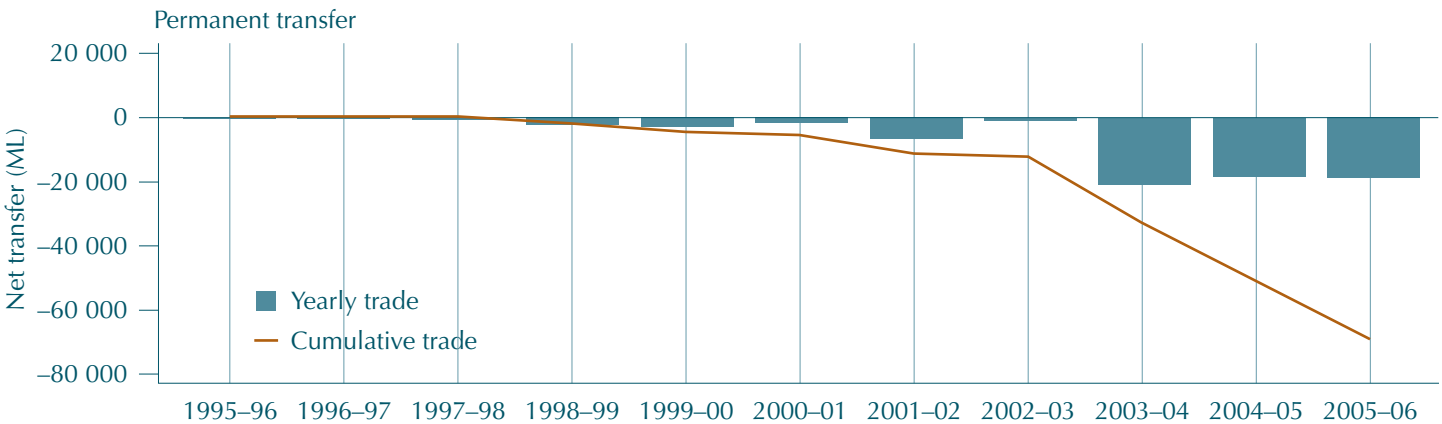
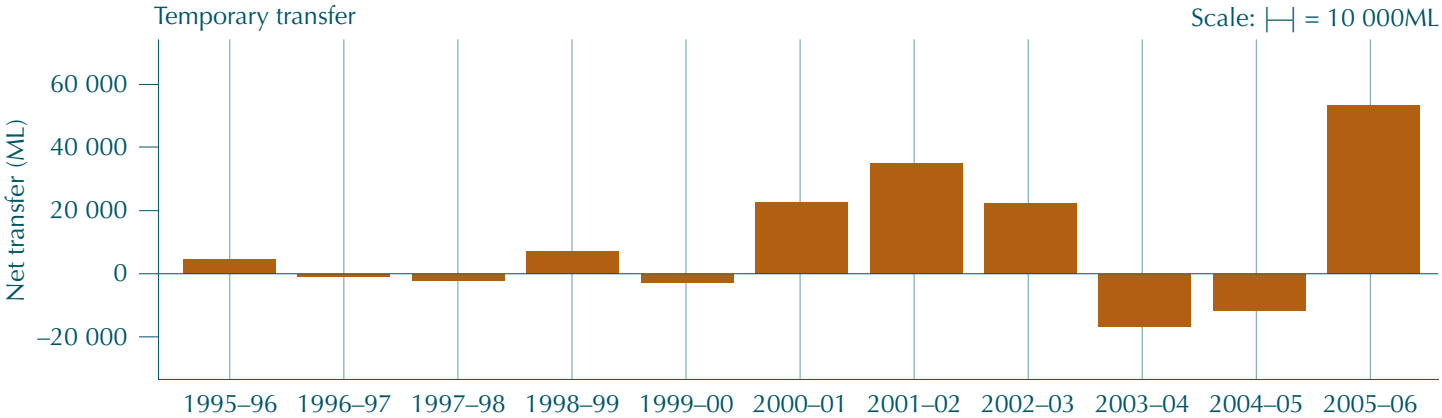
The amount of net temporary transfers out of the Lower Murray system has been increasing: about 5000 megalitres were traded out in each of 2000–01 and 2001–02, 15 000 to 20 000 megalitres were traded out in each of 2002–03 and 2003–04, and nearly 30 000 megalitres were traded out in each of 2004–05 and 2005–06.

Permanent trading resulted in a net transfer of water into the system of about 5000 megalitres each year from 1997–98 to 2002–03. The net inflow increased dramatically to over 20 000 megalitres each year between 2003–04 and 2005–06, leading to a cumulative increase in water entitlements in the system of more than 100 000 megalitres since trading began in 1991–92 (ACCC 2006). In 2005–06, 371 828 megalitres of entitlements were held in this system (Lower Murray Water 2006). The cumulative permanent trade thus represents 30 per cent of total entitlements.

The consistent inflow of entitlements has outweighed the temporary trade outflow to give an overall positive net transfer of water when all the water reallocated through trade is considered.

Figure 2.2 The Goulburn system, 1995–96 to 2005–06

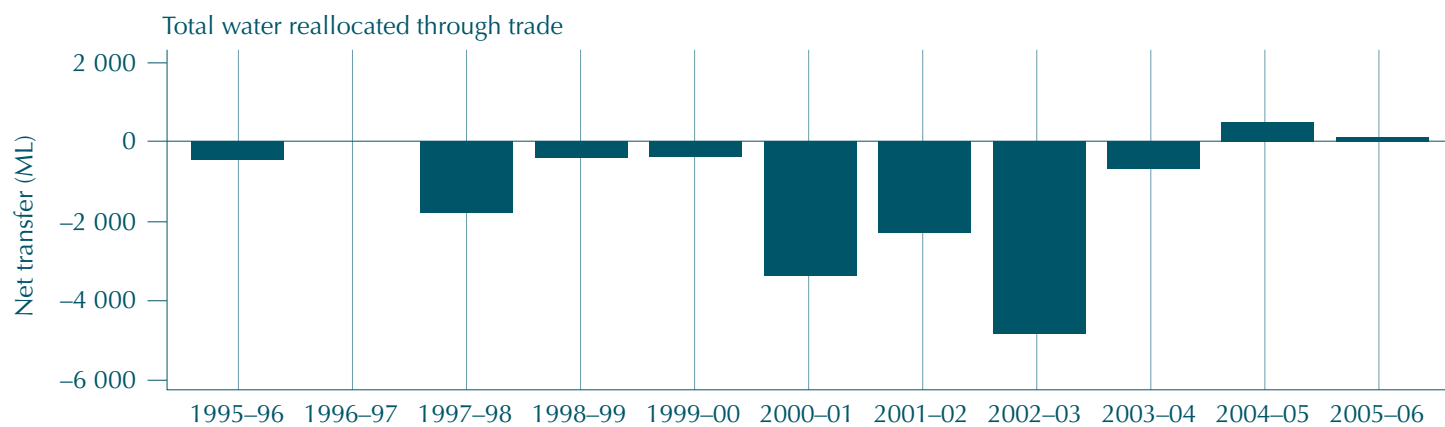
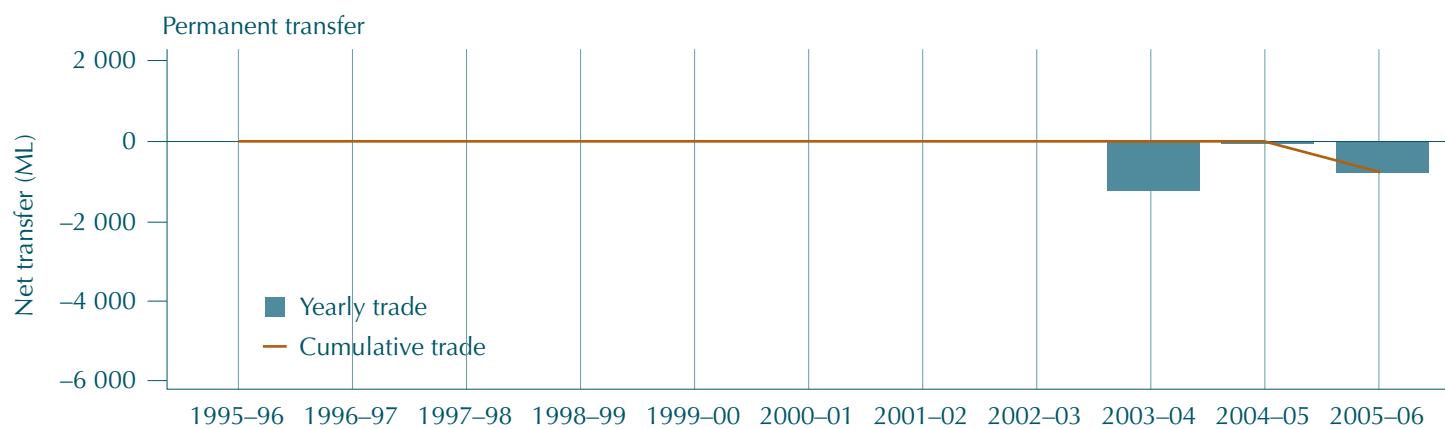
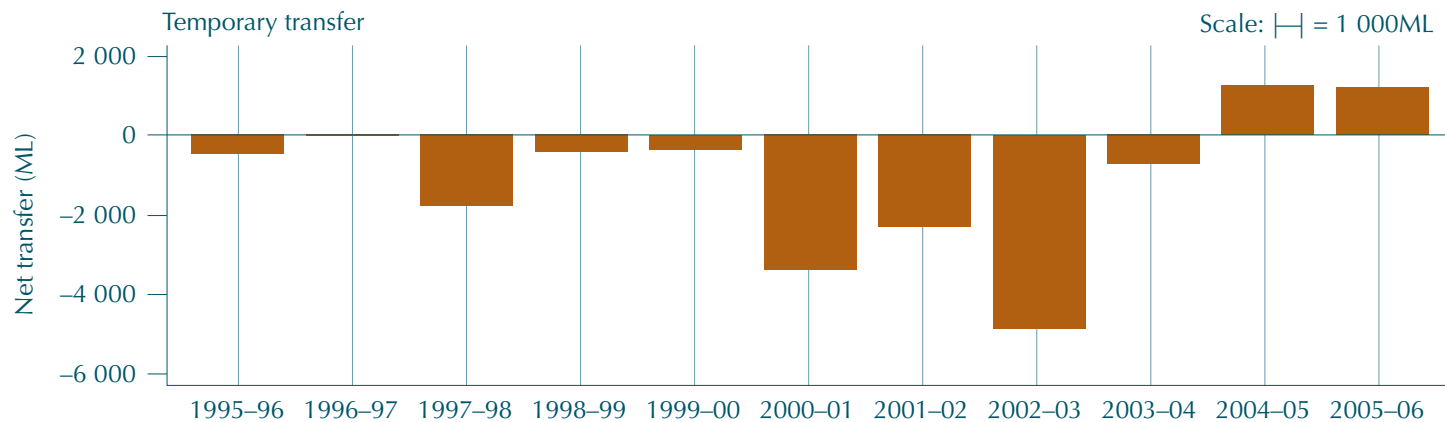
Goulburn system total



Sources: Goulburn–Murray Water (2006a and previous years).

**Figure 2.3 The Campaspe system, 1995–96 to 2005–06**

Campaspe system total



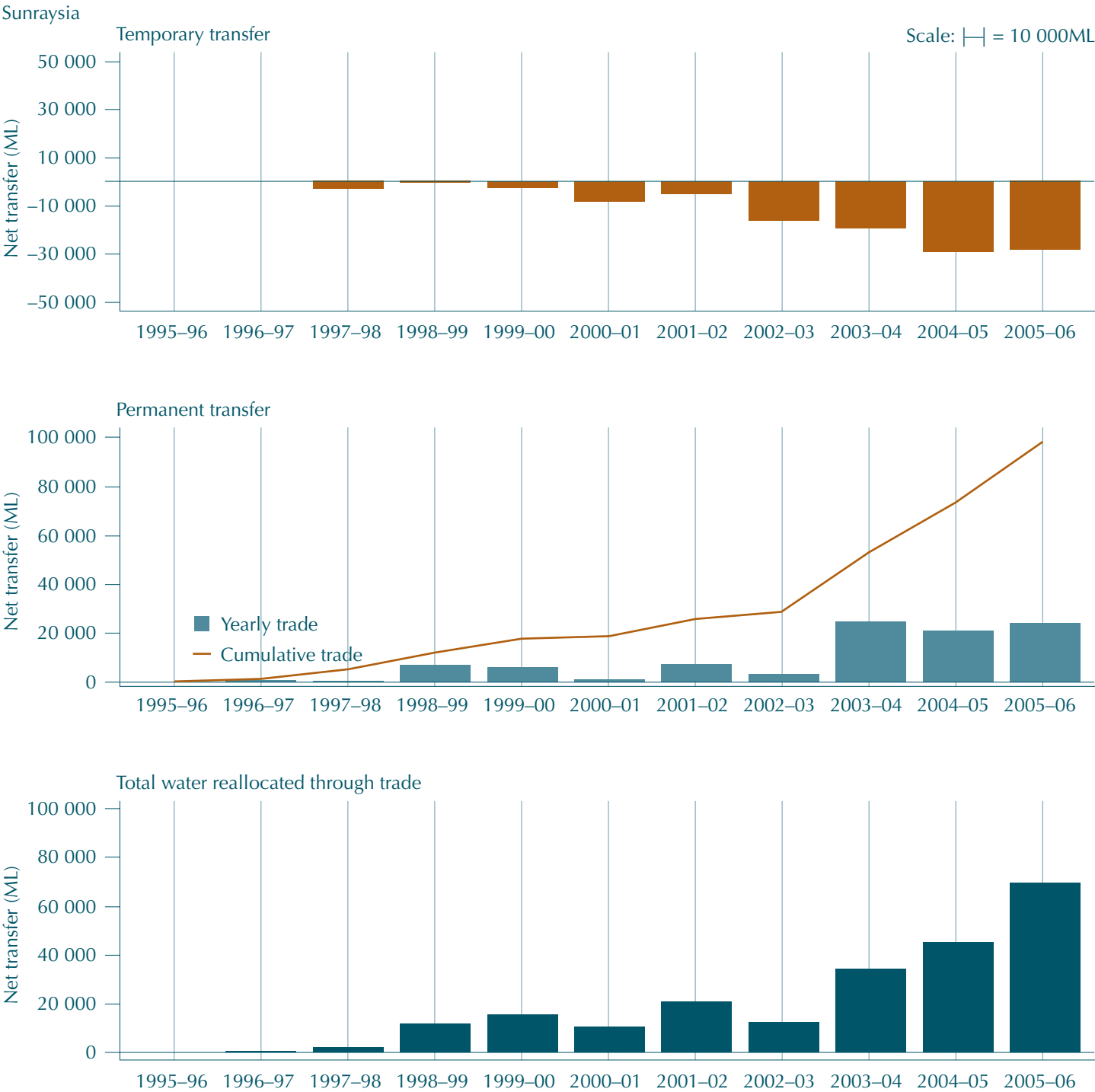
Sources: Goulburn–Murray Water (2006a and previous years).

Figure 2.4 The Murray system above Nyah, 1995–96 to 2005–06



Sources: Goulburn–Murray Water (2006a and previous years).

Figure 2.5 The Lower Murray system, 1995–96 to 2005–06



Sources: ACCC (2006), Lower Murray Water annual reports, Sunraysia Rural Water annual reports.

## Water trading in the case study regions

The patterns of water trading at the system level provide important context, but this study focuses on the regions of Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna. Detailed information was collected on the temporary and permanent water trading of these regions.<sup>4</sup> The following discussion examines temporary and permanent trading and the total water volumes reallocated through trade in the three regions during the past decade.

It is important to note that the figures shown are for temporary and permanent net transfers of water in the selected regions only and not for all the regions between which water trading is possible. This means that the total trade in water allocations or entitlements will not necessarily net to zero across the selected regions. In fact, it is apparent that the case study regions (in aggregate) have been net importers of both temporary and permanent water. As discussed in relation to the Goulburn–Murray Water and Lower Murray Water systems, there is little trade into or out of the aggregate of these regions. This implies that regions other than the chosen case study regions are net exporters of water.

The following regions were significant sellers of temporary water:

- Goulburn River—a net exporter of about 120 000 megalitres between 1995–96 and 2005–06
- Murray River—a net exporter of about 65 000 megalitres between 1995–96 and 2005–06
- Goulburn Valley Water—a net exporter of about 56 000 megalitres between 1995–96 and 2005–06
- New South Wales—a net exporter of about 46 000 megalitres between 1995–96 and 2005–06

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<sup>4</sup> Similarly detailed trade information for areas within the Sunraysia system—Merbein, Mildura, Red Cliffs, Robinvale and private river diverters—was collected for a number of recent years. The data are presented in the Sunraysia case study (see Part Two).

- Shepparton—a net exporter of about 38 000 megalitres between 1995–96 and 2005–06.

The following regions were significant sellers of permanent water:

- Swan Hill—a net exporter of about 16 300 megalitres between 1995–96 and 2005–06
- Shepparton—a net exporter of about 10 500 megalitres between 1995–96 and 2005–06
- Goulburn River—a net exporter of about 3700 megalitres between 1995–96 and 2005–06.



Aquaculture, Sunraysia

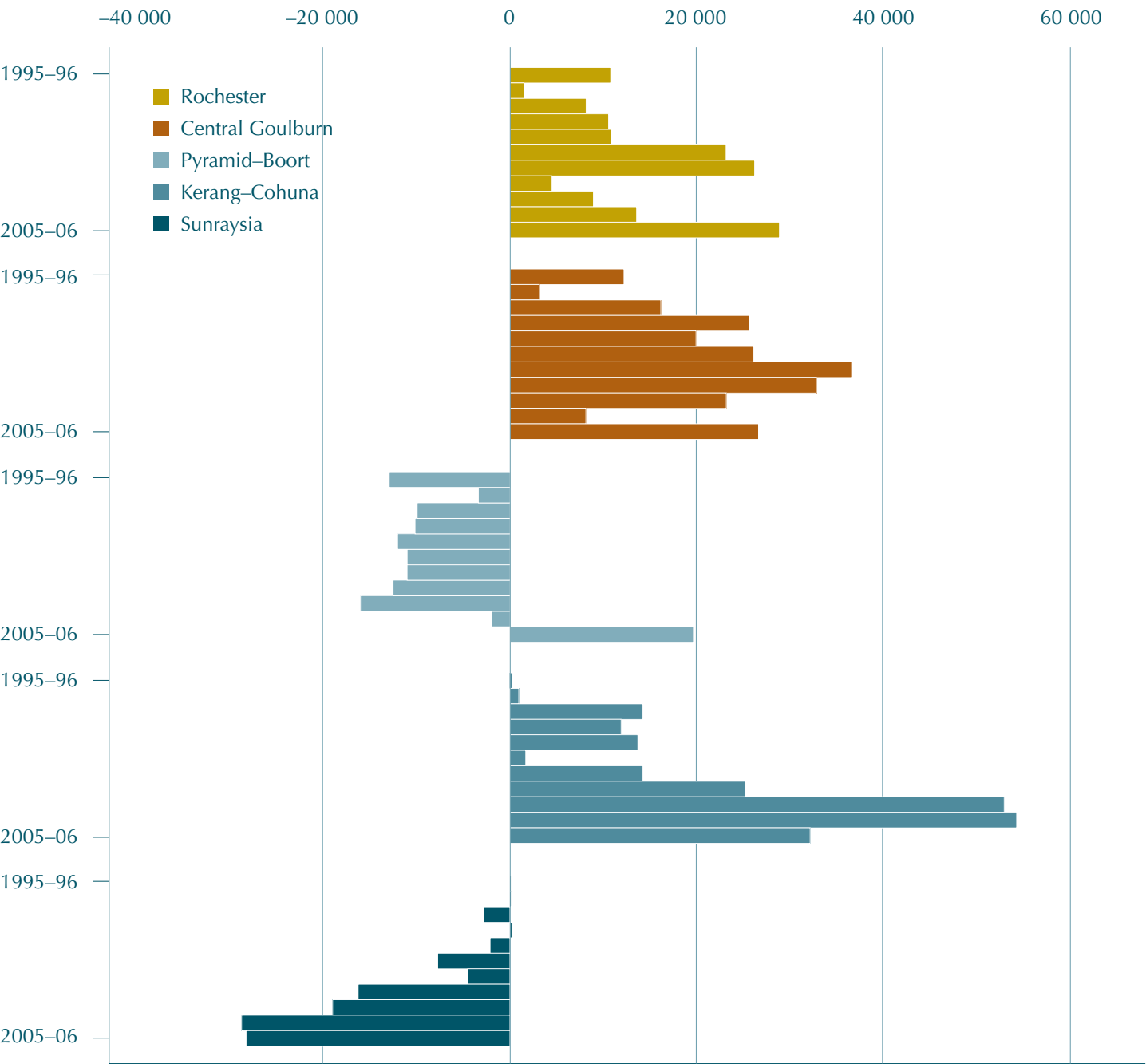
### Temporary trades

Rochester, Central Goulburn and Kerang–Cohuna have generally been the water purchasers in the temporary market, while Pyramid–Boort and Sunraysia entitlement holders have been selling water allocations (see Figure 2.6). In 2005–06 regions other than those being examined in this study sold large volumes in temporary markets, since all but Sunraysia had net transfers into their region.



Figure 2.6 Temporary water trading, 1995–96 to 2005–06

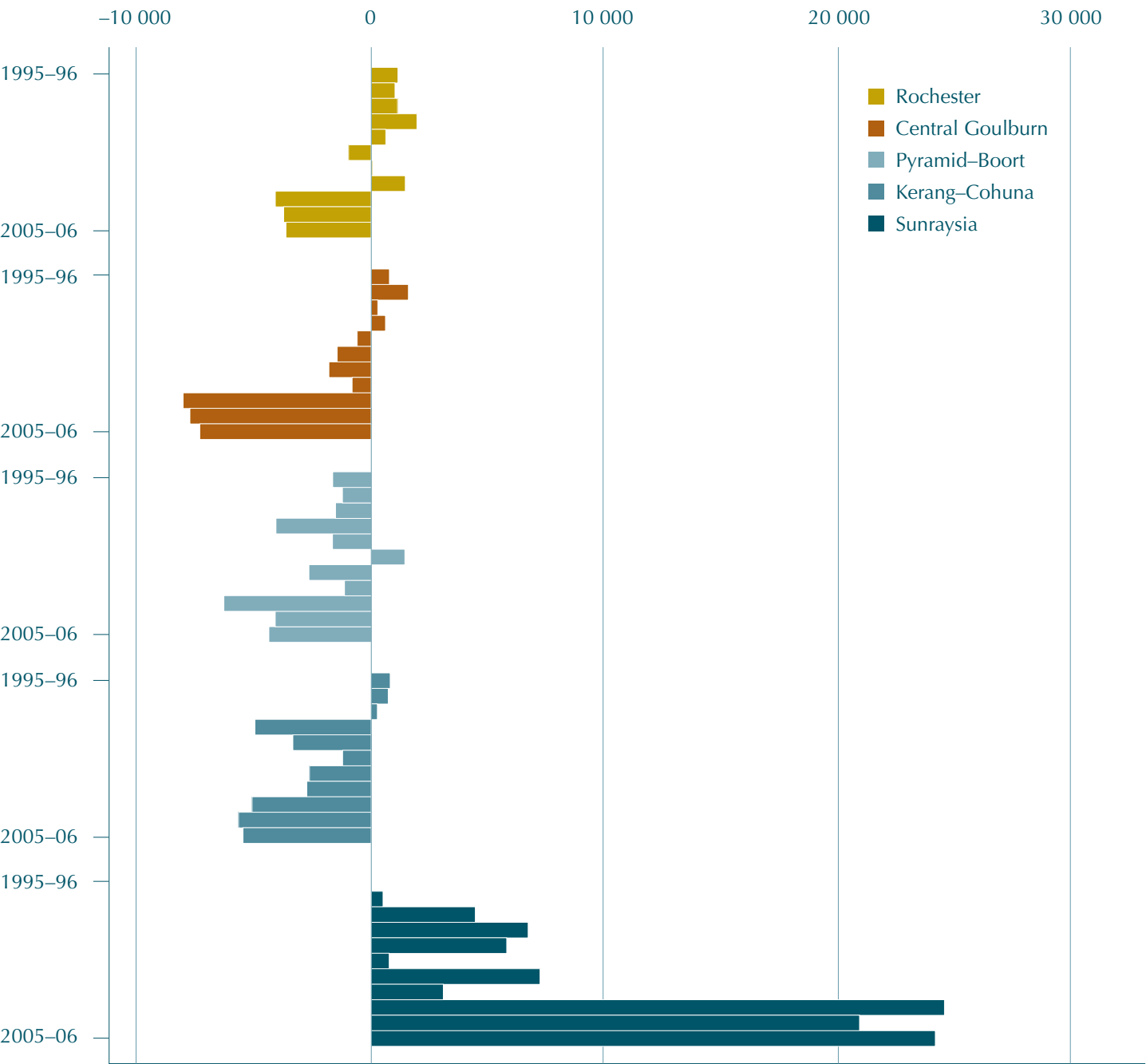
Net temporary transfers (ML)



Sources: ACCC (2006), Goulburn–Murray Water annual reports, Lower Murray Water annual reports, Sunraysia Rural Water annual reports.

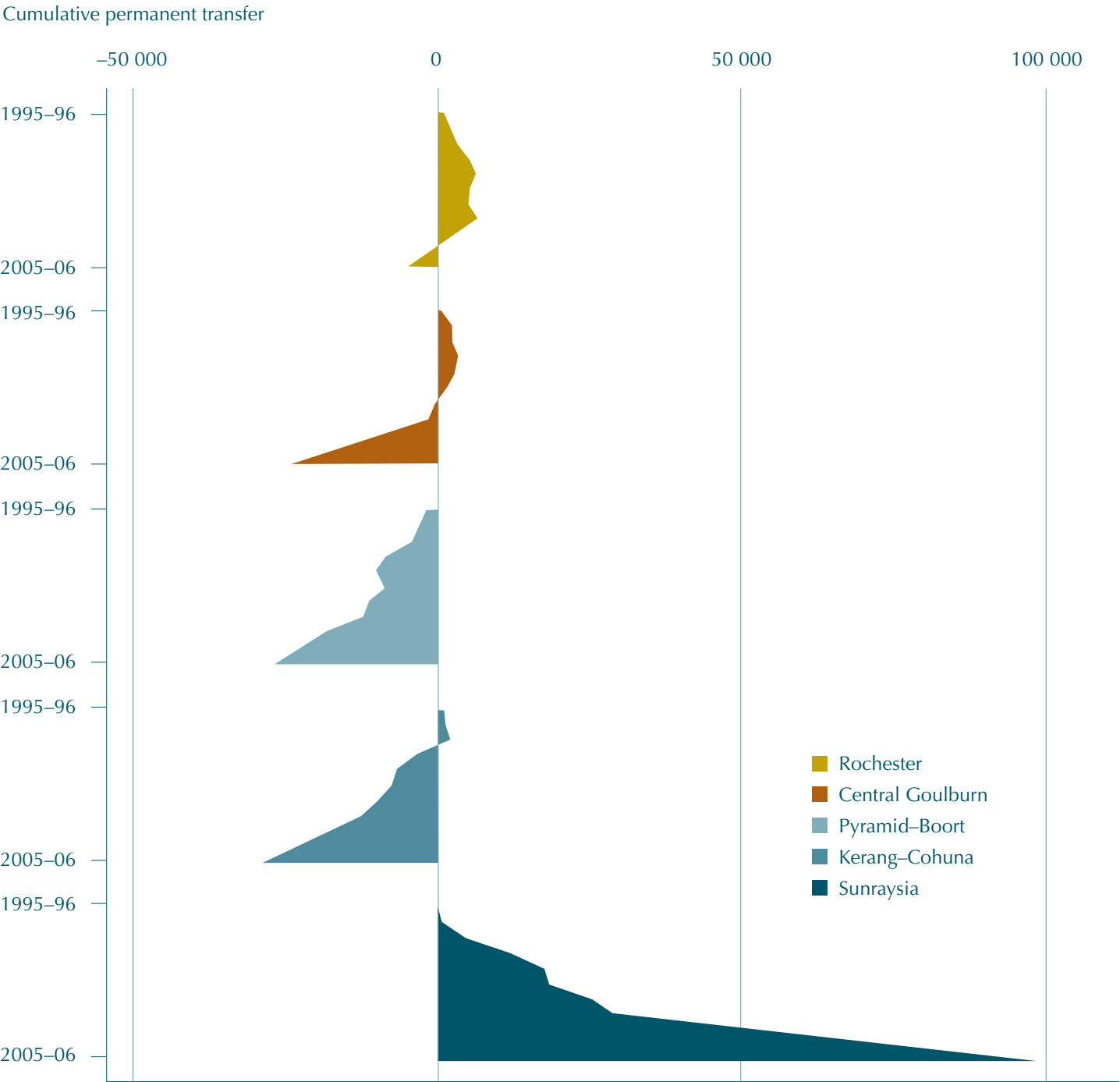
Figure 2.7 Permanent water trading, 1995–96 to 2005–06

Net permanent transfer (ML)



Sources: ACCC (2006), Goulburn–Murray Water annual reports, Lower Murray Water annual reports, Sunraysia Rural Water annual reports.

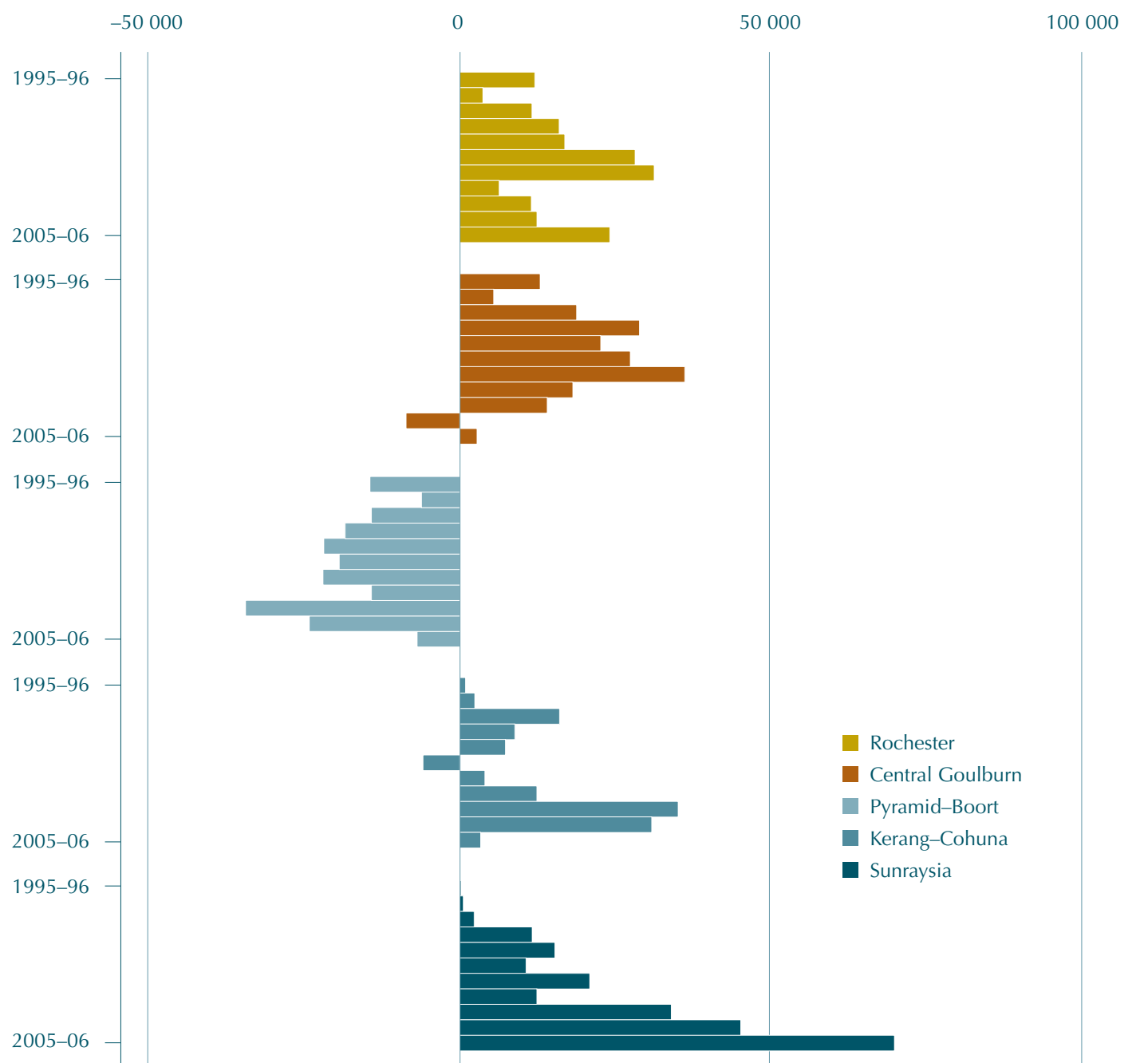
Figure 2.8 Cumulative permanent water trading, 1995–96 to 2005–06



Sources: ACCC (2006), Goulburn–Murray Water annual reports, Lower Murray Water annual reports, Sunraysia Rural Water annual reports.

**Figure 2.9 Total water reallocated through trading, 1995–96 to 2005–06**

Total water reallocated through trade (ML)



Sources: ACCC (2006), Goulburn–Murray Water annual reports, Lower Murray Water annual reports, Sunraysia Rural Water annual reports.

## Permanent trades

In the early years of permanent trading, water users in the dairy regions of Rochester and Central Goulburn and the horticultural region of Sunraysia generally bought water entitlements from sellers in mixed farming regions such as Pyramid–Boort. There was increased activity in permanent water trading from 2003–04 to 2005–06, with the regions serviced by Goulburn–Murray Water selling water entitlements and these entitlements being purchased by irrigators in the Sunraysia region (see Figure 2.7).

The cumulative permanent water trading history shows that water entitlement trading in the 2003–04 to 2005–06 irrigation seasons dominates the smaller volumes of permanent trading in previous years (see Figure 2.8).

## Total water reallocations through trade

Figure 2.9 shows the total water reallocated through trading for the study regions from 1995–96 to 2005–06.

The total water reallocated through trading is calculated by summing the change in available water through allocations to traded entitlements and the change in available water through temporary trade in allocations that year. This shows how the often-offsetting effects of temporary and permanent trading have led to increased water for irrigation use in Sunraysia and Rochester, Central Goulburn and Kerang–Cohuna, while reducing the water used in Pyramid–Boort. As noted, the study regions (in aggregate) have been net importers of both temporary and permanent water, which means that the total water reallocated through trade has also increased in aggregate across the regions.

An important determinant of this offsetting pattern in water trading is Sunraysia horticultural developers, who are buying permanent entitlements in order to secure future water supply for new plantings. While the plantings are young they do not require the full volume of water, so allocations are temporarily traded out of the region, which means that in future, as the current plantings mature, there will be less water Sunraysia irrigators will be willing to temporarily trade out of the region.

Intra-regional trade is another mechanism for reallocating water between irrigators in the same industry (such as dairying in Rochester and Central Goulburn) or irrigators that are close by but produce different crops (such as mixed farms and horticulture in Boort). This is discussed further in Appendix C.

## The main patterns

Three main patterns emerge from the analysis of water trading data:

- There is often an offsetting effect of temporary and permanent trading. Many regions made (net) purchases of water allocations while (net) selling water entitlements or were (net) sellers of water allocations while (net) buying water entitlements.
- Temporary trade volumes are generally larger than permanent trade volumes. In many regions the temporary trade volumes outweigh the effect of cumulative permanent trading.
- There have been big increases in volumes of permanent trading in the past few years—most notably 2003–04, 2004–05 and 2005–06—and regional limits on selling water entitlements have been reached. This period coincides with historically low allocations on the Goulburn system and, as a consequence, severe financial pressure on irrigators in those areas.

Regional experiences of water trading in the past decade have varied considerably, in terms of the size and direction of trading and the type of property right being traded (permanent water entitlements or temporary seasonal allocations):

- Initially, from 1995–96 to 2001–02, the dairying regions of Rochester and Central Goulburn and the horticultural region of Sunraysia were all buyers of water entitlements, the water being bought from mixed farming regions such as Pyramid–Boort.

- The dairying region of Kerang–Cohuna was initially a small buyer of water entitlements, but from 1997–98 increased demand from Sunraysia, coinciding with restricted supply from Pyramid–Boort because annual trade out was limited to 2 per cent of total entitlements, meant that Kerang–Cohuna became a seller of entitlements.
- In the three seasons from 2003–04 to 2005–06 Pyramid–Boort and Rochester, Central Goulburn and Kerang–Cohuna sold permanent water entitlements to meet further increases in demand from Sunraysia.
- In aggregate, irrigators in Sunraysia are buying water entitlements and selling water allocations. Nonetheless, within Sunraysia there has also been trade out of irrigation districts. Private diverters (those outside the districts) account for virtually all inward trade.
- In aggregate, river diverters in the Sunraysia region are buying water entitlements and, at least until their new crops mature, selling water allocations.
- In aggregate, district irrigators in Sunraysia are currently selling water entitlements.



Channel, Red Cliffs



### 3. The drivers of water use and trading

Identification of the key drivers of water use and trading, to explain the patterns of water trading discussed in Chapter 2, can be done at both the micro and the macro levels.

A micro-level analysis focuses on the factors influencing individual decisions about water use and trading. A number of previous studies have focused on understanding individuals' decisions from the perspective of the individuals' financial and personal circumstances; this includes recent work done in the Loddon–Campaspe Irrigation Region (Fenton 2006). The previous work suggests that decisions made by farmers are a response to many factors. For example, Fenton found that the motivation to sell water permanently was almost exclusively to do with financial difficulties, while the motivation not to sell temporary water was more influenced by social norms—including social labelling and beliefs about the impacts of permanent water sales.

Farm-level decisions can be influenced by individual attitudes and can be subject to a degree of inertia. As has been observed before, many farmers initially adopted a cautious approach to water trading, perhaps reflecting a lack of awareness of how the market worked and the costs and benefits of trading in it. Only 20 per cent of irrigators had been involved in any form of trading by 1996 (DNRE 2001), but participation in the market is now widespread (Bjornlund & Rossini 2006).

Examination of the factors determining individual decisions requires individual survey analysis, as discussed in the regional case studies in Part Two. The discussion in this chapter focuses on

the broader economic and other factors affecting the industries and regions in question. In any event, individual water trading decisions need to be seen in the context of the broader economic and other factors that explain the key drivers in specific regions or more generally.

A more macro-level analysis focuses on interrelated factors such as structural changes in the economy, the state of international commodity markets, water availability, risk management and farm financing decisions, and the regulatory framework governing water trading.

This type of analysis focuses on water as an input to agricultural and horticultural activities. Economic theory would predict that water trades to activities where it has highest marginal value; that is, the trade is driven by divergences in the value of water in different uses at different times. Further, different factors are likely to affect the temporary and permanent water markets. For example, commodity prices and other industry fundamentals that affect returns as a whole and returns from water in particular are likely to be important determinants of temporary water trades. Permanent trades are likely to be determined by longer term structural changes.

This chapter looks at the factors determining water use and trade:

- the history of irrigation districts—the way water was allocated and used in the past
- water scarcity



- industry conditions and commodity prices affecting the marginal value of water in different productive activities.

## Irrigation history

With the notable exception of the Pyramid–Boort region, the original irrigation schemes matched allocations of irrigation water to farm size. An objective was to create family farms with more or less standard (owner-operated) labour requirements across a range of industries. These ‘home maintenance areas’ varied between industries and, importantly, also over time, providing evidence of the longstanding pressures for farm consolidation. For example, in the Sunraysia region standard vineyard sizes steadily increased from 4 hectares in the Mildura settlement of the 1890s to 4–6 hectares in Merbein in the 1910s to 6–8 hectares in Red Cliffs in the 1920s and 8–10 hectares in Robinvale in the 1940s. Water rights in these districts were in essence granted on the basis of 3 acre-feet of water per acre (9 megalitres a hectare). On average, irrigators apply less than this amount.

In Rochester, Central Goulburn and Kerang–Cohuna the Victorian State Rivers and Water Supply Commission surveyed the soils judged most suitable for irrigation before buying land, subdividing, supplying water and finding new settlers to farm the land. Each irrigation farm was allocated a legal right to sufficient water to irrigate the entire farm—1 acre-foot of water per acre (3 megalitres a hectare).

By contrast, in the Pyramid–Boort region, which had a history of failed privately owned ‘irrigation trusts’, the State Rivers and Water Supply Commission supplied water to *existing* settlers. Farm size in Pyramid–Boort had been set by the minimum subdivision size allowed for in the Victorian Selection Acts. The commission could not supply enough water to irrigate all the land on any given farm, so, rather than supplying a few farms with all the water they needed (as in the Goulburn Valley), the commission shared the available water between all the farms with access to its channels. It granted water rights at the rate

of 1 acre-foot for every 5 acres (0.6 megalitres a hectare). This was insufficient to irrigate an entire farm. The channel system distributing the water in this region was also longer and more complex than channel systems in the Goulburn Valley; it was harder to manage, and the water delivered to the area’s farms arrived more irregularly than water supplied to farms in the Goulburn Valley.

The size of the initial holdings in each irrigation area, the way the land was laid out and the initial distribution of water entitlements are still affecting farm viability and the trade in water. Without water trading, irrigators could secure additional water only by buying additional properties and transferring the water from them. Once the nexus between land and water was broken, water could be moved to industries and farms with superior income and growth prospects. This lessened the initial handicap of inadequate farm size, which led to high unit capital and labour costs and low incomes.

Moreover, the prosperity of irrigated industries changed over time. Sometimes this was because of the ebb and flow of commodity markets; at other times profitability was affected by government decisions on industry assistance. For most of their history, irrigated horticulture and dairying have had above-average levels of industry assistance, usually in the form of home consumption price schemes backed up by restrictions on imports and other protective devices. Irrigated mixed farms based on sheep production and cereal cropping traditionally received little product-related assistance.

Before water was tradeable, water entitlement holders who either did not use any of the water they were entitled to or only partially used it surrendered the right to use that water. With the advent of trading, most of these ‘sleepers and dozers’ entitlements would have been activated since they can now be sold for financial gain.

The regional case studies in Part Two elaborate on the diverse origins of Victorian irrigation districts.

## Water scarcity

Like any other markets, water markets are most active when the commodity being traded is scarce. In the Murray–Darling Basin the availability of supply is determined largely by rainfall.

The demand for irrigation water increases in dry years because there is increased water demand by crops through evapotranspiration as well as less rain falling on the land and so a greater need for irrigation water as a supplement. Dry conditions generally decrease the amount of water available for irrigation because there is less inflow into storages, which results in lower allocations to the holders of water entitlements. Because farm production systems are geared towards using a particular amount of water, low allocations mean either that production will be reduced or that additional volumes of water will be sought through water trading. This is reflected in the increased water trading activity in recent years (as shown in Chapter 2) and the price at which water entitlements and allocations are traded.

Different industries and different producers assign different relative values to these additional volumes of water (the value of the marginal product of the water in particular water use activities). Generally, these valuations diverge further with more extreme decreases in allocations as a result of the characteristics of production—for example, the ability to substitute away from water to other inputs (such as labour, capital or feed) or the flexibility to alter production. As Appels et al. (2004) pointed out:

- Annual croppers have the greatest flexibility and so can act most opportunistically in response to water prices. They can choose whether or not to plant at the beginning of each season.
- Dairy farmers might be able to substitute (to some degree) away from irrigating pasture and towards other forms of feed—although the price of these feed sources can rise in dry years—or reduce production by agisting or selling cows.
- Horticulturists might be willing to pay high prices for water in order to keep their vines or trees alive because of the high costs and lengthy times involved in re-establishment.

In fact, these three behaviours were all observed in 2006–07:

*Fodder prices have risen a lot but not as much as water ... I've heard of some big fodder producers deciding (that growing hay) was not worth it and selling their allocations this year ... This was exacerbating the shortage of stock feed. Some dairy farmers had chosen to sell some cattle and then sell water allocations to benefit from the high prices. An unexpected turn in the grape market has made it viable for some grape growers to buy extra water to make up for low allocations caused by the drought. (The Age, 3 January 2007, p. 19)*

Bjornlund and Rossini also found:

*The most important drivers of farmers' willingness to pay for water are water supply and demand represented by the level of seasonal allocations as well as precipitation and evaporation. High value farmers with investments in long-term plantings, pastures and equipment are forced to pay high prices during periods of scarcity to limit their potential losses caused by drought. (2006, p. 13)*

Dry years have obviously had a big impact on water trading activity in the Victorian Murray, with large volumes of water traded and high prices being observed in years such as 2002–03 and 2006–07.

## Industry characteristics and changes

Water use is different in the various irrigation industries. The industry shares of irrigation water in northern Victoria are roughly one-half for dairying, one-third for mixed livestock and cropping, and the remainder for horticulture. About half of the horticulture is in the Goulburn Valley (dominated by stone fruits) and the other half on the Murray (mainly grapes). Water is not a big cost in horticulture compared with other inputs, but it is a largely unavoidable cost. Other industries have greater flexibility in water use. Furthermore, horticulture's smaller share of total water use makes that industry's expansion easier than for extensive irrigation so far as water is concerned.

Irrigation in northern Victoria has been categorised in several ways, including by location, industry and markets, extent of government intervention, source of water, environmental effects, and type of irrigation. Expanding this classification, the following distinctions are useful:

- private diverters versus (former) government irrigation settlements
- horticulture versus irrigated dairying versus irrigated mixed farming
- interruptible versus non-interruptible irrigation production systems
- gravity versus pumped irrigation districts
- Murray River versus other sources of irrigation water
- flood and furrow irrigation versus capital-intensive on-farm irrigation techniques
- irrigated production for domestic and export markets
- regulated versus unregulated irrigated industries.

Each of these distinctions implies economic consequences for irrigation farming and has influenced the patterns and impacts of water trading. The way government irrigation settlements were established meant skewed size distributions from the start, with a high proportion of small farms. Some locations were unsatisfactory on environmental criteria. Private diverters—especially important in horticulture—choose their own scale of operation. More prudent planning processes based on zoning now seek to reduce any potential adverse environmental consequences of horticulture.

Changes in the economic circumstances of different industries are important determinants of water trading. As the Victorian Government's White Paper noted:

*Trade out of gravity districts has surged since mid-2003. The two per cent annual limit on water trading out of certain areas has been reached—or is close to being reached—*

*for four out of Goulburn–Murray Water's six areas. On the selling side, this surge reflects the accumulated financial pressure of the drought, especially in the Goulburn system. As well, currency movements have helped to depress prices for exports, putting added pressure on the dairy industry. The surge in trade is also being driven by large new irrigation developments—almonds, olives and wine grapes—between Nyah and Robinvale. One developer alone is looking for 50 000 megalitres. The pattern of trading has changed since the 1990s, when most trade was within regions, dairy farmers did much of the buying, and the rate of change was moderate. Now, dairy farmers are joining mixed farmers as sellers. In past downturns, farmers had to stay on their farms until things improved; now they can sell their water and move away. (Department of Sustainability and Environment 2004, p. 79)*

The following discussion looks at how the changing circumstances of different industries have affected water use and hence water trading, including in the case study regions. Future changes in commodity prices will also affect prospects in different industries and consequently water trading patterns.

## Dairy farming

Victorian dairies produce over 60 per cent of Australia's fresh milk and 75 per cent of its manufactured dairy products. Dairying accounted for \$2.4 billion (27 per cent) of the total value of agricultural production in Victoria (\$8.7 billion) in 2003–04 (Department of Primary Industries 2006). The gross value of milk rose by 5 per cent compared with 1998–99, to \$1.7 billion, mainly because of an 8 per cent increase in the average price (ABS 2005).

Dairying occurs in the irrigation areas of northern Victoria (encompassing the case study regions) and in the state's high-rainfall (more than 700 millimetres a year) south-west, north-east and Gippsland regions.

### Trends in the dairy industry

In the 1990s there were generally favourable terms of trade for manufactured dairy products, and the dairy industry expanded accordingly. Water trading aided this expansion. The industry became fully deregulated in 2000; this was accompanied by an adjustment package. Restrictions on interstate trade in fluid milk were also removed. Figure 3.1 shows the effect on farm-gate prices for milk.

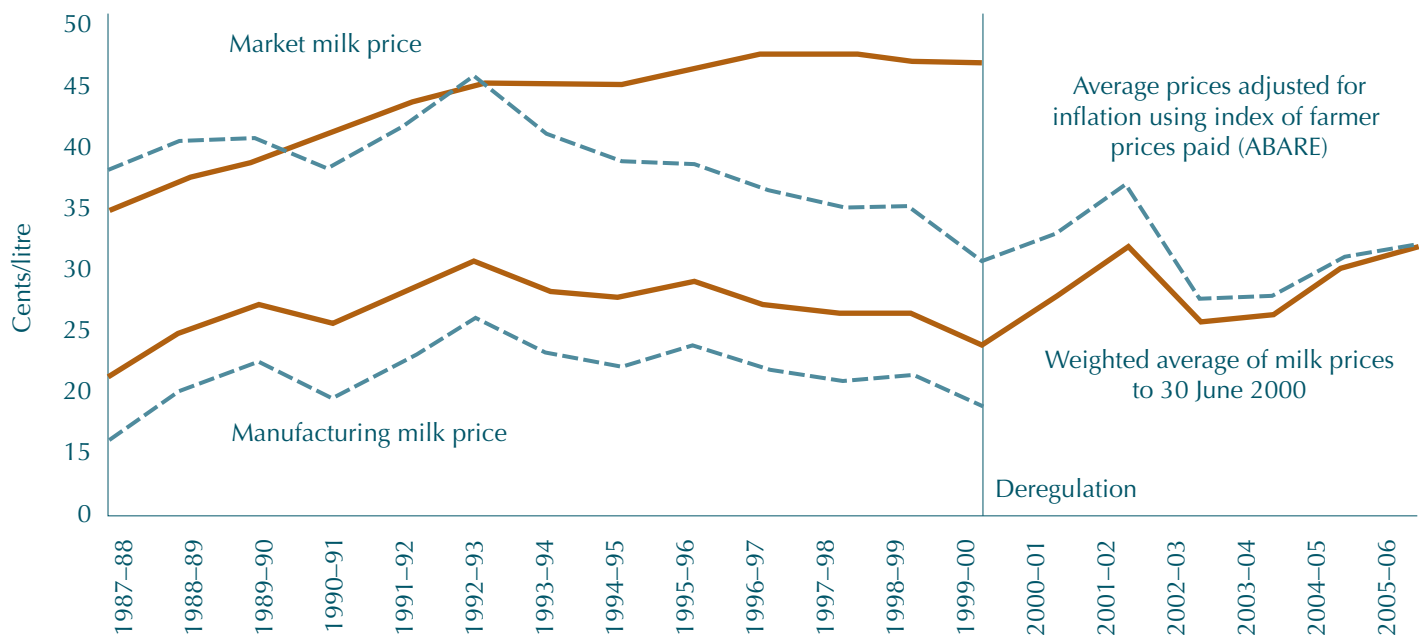
Irrigated dairying can be thought of as a quasi-interruptible production process providing opportunities for modifying the amount of irrigation water used by substituting purchased feed for irrigated pastures, agisting cattle, varying the culling rate, and altering the balance of annual and permanent pasture.

The risk management balance for dairy farmers is not an easy one. In severe droughts the prices of water and purchased feed move

in the same direction. Costs thus rise sharply while production is moving in the other direction (see Table 3.1). The length of a drought cannot be known. In the 2002–03 drought season it turned out that the decision to buy feed and water was not the best one (provided agisted cattle were well cared for) because the drought conditions had led to increased prices for both water and feed. Milk production fell sharply in northern Victoria during 2002–03 and had not recovered before the onset of the extremely dry conditions of 2006–07. Water trading creates opportunities to manage these risks, but not all irrigators will make the right call in such an uncertain environment. This was evident in the responses of people interviewed in the study regions.

There has been considerable change at the industry level. Most noteworthy is the aggregation of dairy farms (see Table 3.2) in order to gain economies of scale in dairy production.

**Figure 3.1 Inflation-adjusted farm-gate prices for milk, 1987–88 to 2005–06**



Note: Figures for 2005–06 are provisional.

Source: Dairy Australia (2006a).

**Table 3.1 Milk production in Victoria, 1999–2000 to 2005–06**

(million litres)				
Year	Gippsland	Northern	Western	Total
1999–00	2 036	2 755	2 079	6 870
2000–01	2 026	2 744	2 014	6 784
2001–02	2 191	3 006	2 208	7 405
2002–03	2 008	2 526	2 050	6 584
2003–04	1 888	2 511	2 035	6 434
2004–05	1 965	2 567	2 081	6 613
2005–06	2 023	2 510	2 050	6 583

Sources: Dairy Australia (2006a), Dairy Research and Development Corporation (2003).

**Table 3.2 Change in the Victorian dairy industry, 1979–80 to 2005–06**

Year	Number of registered dairy farms	Number of dairy cows ('000 head)	Milk production (million litres)
1979–80	11 467	1 047	3 151
1989–90	8 840	968	3 787
1994–95	8 379	1 113	5 114
1999–00	7 806	1 377	6 870
2004–05	6 108	1 295	6 613
2005–06	5 892	1 280	6 583

Source: Dairy Australia (2006a).

### *The water demand of dairying*

In the early 1990s the industry was undergoing rapid aggregation, with farms getting larger. For many dairy farmers, the simplest strategy for increasing production was to use all the sales water made available to them at the time by Goulburn–Murray Water. In the eastern Murray system many dairy farms built production systems based on the assumption of an additional sales water supply equal to 80 per cent of water right. In the less reliable Goulburn system dairy farms often relied on 50 per cent of water right through sales water.

In the mid- to late-1990s dry seasons led to a tightening of the supply and a reduction in the volume of water available for sale. Dairy farmers geared for a high level of sales water availability found themselves forced to either buy supplementary feed or buy water from mixed farmers. As noted in Chapter 2, dairy farmers in regions such as Rochester and Central Goulburn were buying water entitlements at this time.

In the early 2000s dairy farmers were affected by low water availability, and milk prices began to fall. To manage this, the farmers adopted one of three strategies (Barr 2005):

- They could continue to produce milk by purchasing water. The price of temporary water rapidly approached \$300 a megalitre—far greater than a dairy farmer could make from the purchase. The advantage of this option, however, was that it maintained both the herd and the pastures, leaving the farm system ready to respond quickly if water was available the following season. The down side was increased debt.
- They could continue to produce milk by purchasing feed substitutes. Feed prices were high, though, and dryland farmers were also competing for the limited reserves of fodder across the state. This strategy had the advantage of retaining the herd, ready for production in the following season. But perennial pastures would die, debt would increase (albeit to a lesser extent than for the first option) and the return to full production when water availability increased would be slower.
- They could cease production, at least temporarily, and lend or lease the most valuable cows to dairy farmers in southern Victoria or Tasmania. This became known as ‘cow parking’. Not all cows would be available next season, but the nucleus of a herd would be there from which to rebuild production. At the end of the season this left the business with less debt than the other two options, but with a much slower pace of rebuilding production.

In the 2006–07 season the persistent drought and less water for irrigation stymied pasture growth, driving up fodder costs. In addition, farm-gate milk prices were forecast to fall by 3 per cent during the year. This led to many farmers drying off cows early and reducing their herd size, resulting in a fall in Australian milk production of almost 11 per cent in 2006–07 (ABARE 2006).

## Horticulture

Horticulture and fruit growing accounted for \$1.8 billion (20 per cent) of the total value of agricultural production in Victoria (\$8.7 billion) in 2003–04 (Department of Primary Industries 2006). Vegetable, fruit and grape growing were the largest sectors in the horticultural industry; for example, the Victorian grape industry grew from \$332.9 million in 2000 to \$379.4 million in 2004, a rise of 14 per cent (ABS 2005a, 2005b).

Withdrawal of assistance and micro-economic reform have been prominent in horticultural industries for the last couple of decades. This first affected dried vine fruits and citrus in pumped irrigation districts on the Lower Murray, coinciding with the early days of water trading.

### *Trends in wine grapes*

Good prices for wine grapes and confident expectations for the wine industry provided an obvious and welcome adjustment path for producers of dried vine fruits. Wine grape production has lower labour costs than dried vine fruit and at the time was believed to have good export prospects. Water was also traded into these areas for corporate vineyards. Wine grape prices then dropped as the new vineyard investments started producing (see Figure 3.2).

The Mallee Statistical Division—which roughly corresponds with the Kerang–Cohuna and Sunraysia Irrigation Districts—has been the location of most wine grape plantings in northern Victoria and produces the vast majority of Victorian wine (see Table 3.3).

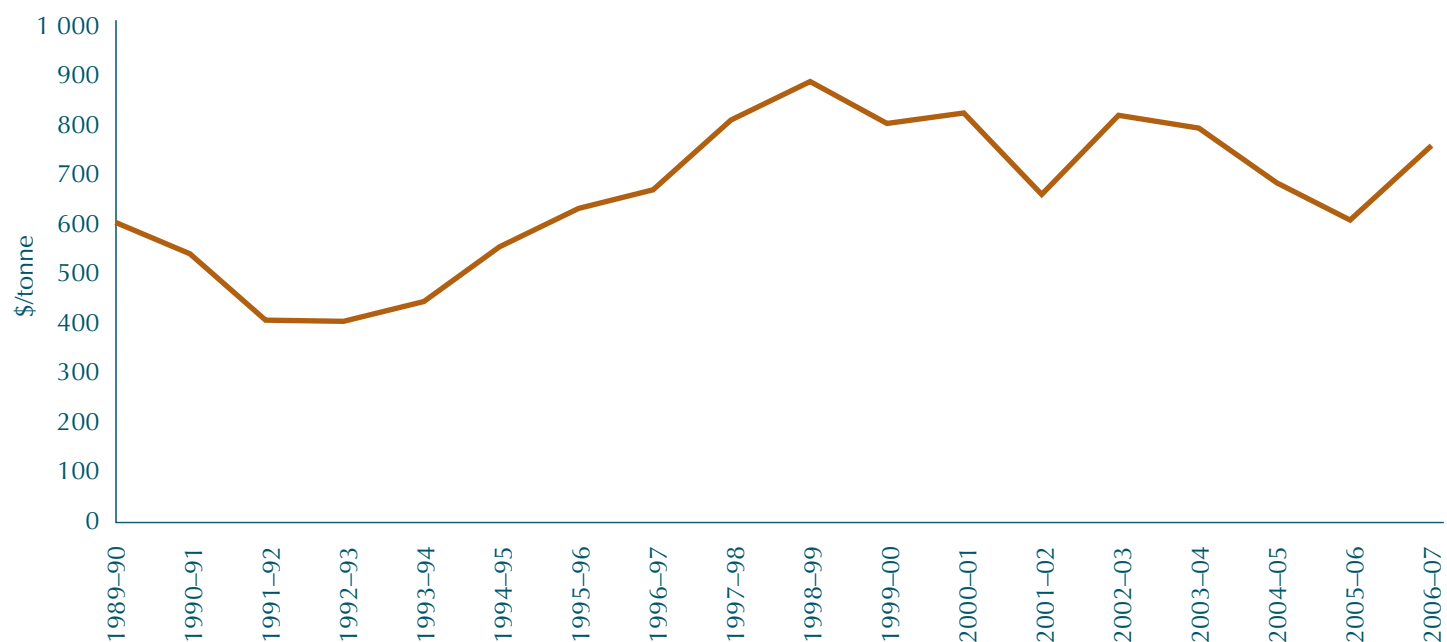
### *Trends in other fruits and nuts*

The Mallee Statistical Division (Kerang–Cohuna and Sunraysia) and the Goulburn Statistical Division (which roughly corresponds with the Rochester, Central Goulburn and Shepparton Irrigation Districts) are the site of other horticultural activity (see Table 3.4). Some of the major developments have been made using managed investment schemes—a financial vehicle for pooling individual investments.

Within the Mallee Division the citrus industry, centred around Mildura, is important. In 2003 it produced 21 per cent of Australia’s citrus from 7300 hectares.

Almonds are also prominent in Mildura, as well as around Robinvale, Boundary Bend and Lindsay Point. About 55 per cent of Australia’s almonds are produced in the area, and production is expected to double soon (SMEDB 2006). National production has almost doubled since 1999 and is expected to treble, from 16 000 tonnes in 2006 to 48 000 tonnes in 2012. In 2004

**Figure 3.2 Grape prices, Australia, 1989–90 to 2006–07**



Source: ABARE (2006 and previous years).

**Table 3.3 Wine grape production and area planted, Victoria, 1994–95 to 2004–05**

Statistical division	Winemaking production ('000 tonnes)			Area of vines bearing ('000 hectares)		
	1994–95	2001–02	2004–05	1994–95	2001–02	2004–05
Melbourne	4.6	9.6	19.5	0.6	2.8	3.0
Barwon	0.5	0.8	2.7	0.1	0.4	0.5
Western District	0.5	0.2	0.9	0.1	0.2	0.2
Central Highlands	1.8	2.7	5.2	0.3	0.7	1.1
Wimmera	0.2	1.2	1.2	0.1	0.4	0.3
Mallee	113.3	458.7	464.6	15.8	23.8	22.6
Loddon	0.8	3.6	6.1	0.2	0.9	1.2
Goulburn	5.3	13.6	20.6	0.7	2.6	2.9
Ovens–Murray	9.9	23.4	29.8	0.9	3.0	3.0
East Gippsland	0.1	0.1	0.2	0.0	0.1	0.1
Gippsland	0.7	0.3	0.5	0.1	0.1	0.1
Victoria	137.6	514.1	551.2	19.0	35.0	35.0

Source: ABS (2005c).



**Table 3.4 Area of fruit and nuts irrigated, Victoria, 1992–93 and 1996–97**

Statistical division	('000 hectares)	
	1992–93	1996–97
Melbourne	2.0	2.2
Barwon	–	–
Western District	–	–
Central Highlands	0.3	0.3
Wimmera	0.2	0.2
Mallee	5.7	6.7
Loddon	0.4	0.5
Goulburn	6.8	7.9
Ovens–Murray	0.2	0.6
East Gippsland	–	–
Gippsland	0.2	0.3
Melbourne	15.9	18.7

– Zero.

Sources: ABS (1994, 1998).

Timbercorp and Select Harvest Limited harvested their first joint venture of 4000 hectares; this corresponds with the jump in almond tree plantations in 2001 (see Figure 3.3).

The boom in the Australian almond industry has been supported by several factors: Australian frost-free, dry-heat climates are ideal for growing almonds; Australia is close to major almond importers in Asia; and the harvest is counter-seasonal to Australia's main competitor, California, which produces 80 per cent of the world's almonds. The boom in the Victorian almond industry has coincided with an increase in world almond prices as a result of increasing demand. The high prices are, however, not likely to be sustained since Californian production is expected to increase by 50 per cent by 2010 (Saitama & Olson 2006).

Timbercorp is an example of a managed investment scheme with significant horticultural plantings in the study regions. It has been

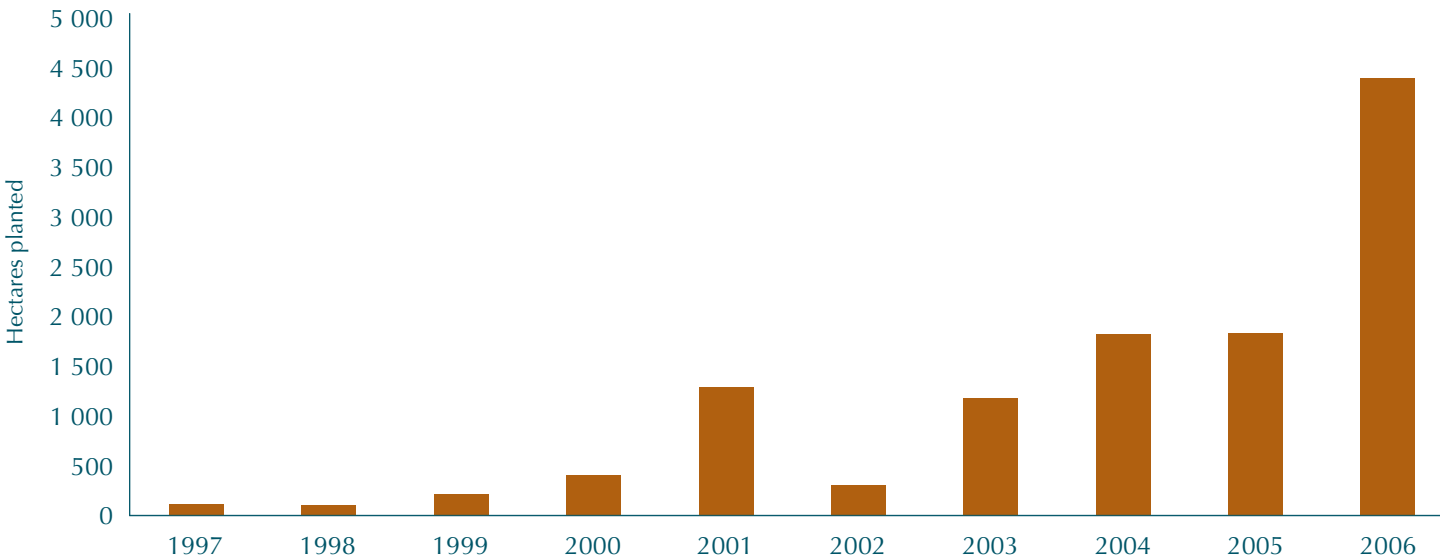
a major driver of the expansion in almond growing in the Sunraysia region and has made large plantings in a number of years (see Table 3.5). Future growth is, however, uncertain in the light of recent changes to the taxation arrangements and product rulings for non-forestry managed investment schemes.

The olive industry has also seen an increase in production in the area, with larger scale commercial plantings appearing in recent years. Timbercorp has been making large plantings in Boort. Industry growth has been supported by the suitable climate and soils and increasing demand, and olive prices have been steadily rising since 1999–2000.

Horticulture in the Goulburn Statistical Division focuses on fruit growing. The biggest change in the industry has been the move away from fruit for processing to fresh fruit.



Figure 3.3 New almond plantings, Victoria, 1997 to 2006



Source: Almond Board of Australia (2006).

### *The water demands of horticultural industries*

Water is a necessary input for investment in horticulture that involves new plantings—either to expand production or to replace old rootstock. The water demands of new trees or vines are relatively well known into the future, so horticulturalists often choose to hold permanent water entitlements as a risk management tool and sell temporary water while the crops are maturing. For example, ‘A specific risk management strategy of Timbercorp is to pre-purchase water rights. According to trade

records the company started purchasing water in the 2000–01 season, and up to the end of June 2004 had purchased total permanent water entitlements of 23,090ML’ (SKM 2006).

Many of the people interviewed for this study explained the observed permanent trade into Sunraysia and temporary trade out of the region as horticulture securing the full future water demand of new crop plantings. The water not required during tree and vine maturation is sold in temporary markets, which has implications for future trends in water movement. For example,

Table 3.5 Timbercorp horticultural projects: hectares developed, 2000 to 2005

Crop and location	2000	2001	2002	2003	2004	2005
Almonds in north-west Victoria	–	224	1101	1114	1224	1446
Olives in Boort	362	980	650	625	155	–

– Zero.

Source: Australian Agribusiness Group (2006).

the temporary trade in water allocations that currently offsets what would otherwise be a reduction in water availability in regions from which water entitlements have been sold might lead to reduced supply in the future.

New horticultural developments allow new varieties of existing crops, or new crops altogether, to be planted and new irrigation techniques to be adopted. In comparison, established vines or orchards provide less flexibility with water use or other production choices.

## Mixed farming

Mixed farms in the Victorian Murray Valley generally produce wool, prime lambs and beef cattle from annual irrigated pastures and irrigated crops.

### *Trends in mixed farming*

In the 1990s, 40 per cent of the water in the Goulburn–Murray system was being used by mixed farmers. Mixed farms were spread throughout the Goulburn–Murray Water irrigation area but were particularly concentrated in the Pyramid–Boort and Kerang–Cohuna districts (Barr 2005).

In the early 1990s a significant event for mixed irrigation farming was the collapse of the reserve price scheme for wool and the subsequent protracted fall in wool prices and production. The

declining wool prices prompted many mixed enterprise farmers to decrease their sheep-related activities and expand in areas such as beef cattle and cropping. Cropping was an attractive alternative because of productivity growth and a readily available market for grain in the nearby dairy industry. Expansion in beef cattle raising was supported by increasing beef prices.

Declines in wool prices were partially offset by favourable prices for sheep meat, which swung the balance of irrigated pasture farming even further in favour of dairying. Trading of water was again important in influencing the adjustment of land, labour, capital and farm enterprises following the hard times in the wool industry.

### *The water demands of mixed farming*

During tough times the selling of water separately from the farm land was not attractive to many mixed farmers: without water, the farm house and the fixed investments on the farm were worth very little. People on smaller farms generally supported themselves through off-farm work; people on larger farms were generating sufficient income for their family and business needs. The mixed farmers who did sell water alone generally did so in response to financial pressure or because they were increasingly dependent on off-farm work and no longer needed the water (Bjornlund & McKay 1999).



## 4. The impacts of water trading

Water trading has allowed water to be moved between different industries and different regions in response to changing industry and regional circumstances.

The central interest of this study was to examine the impacts on communities, industries and individuals of these water movements, with reference to actual experience in the selected regions—Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna. The aim of the fieldwork was to develop an understanding of the social and economic impacts of permanent and temporary water trading in the Murray Valley from the viewpoint of people living in the regions in question.

Examination of the patterns of water trade revealed considerable variation in the regional experience in the past decade—in the size and direction of water trades and the type of water being traded (temporary or permanent). The way these events have affected rural communities has also been highly variable. Gaining clarity about the exact nature of the social and economic impacts was a difficult task since these are complex and interrelated themes.

This chapter summarises the impacts of water trading at different levels:

- for individual irrigators and farms
- for irrigated industries
- for industries associated with the inputs and outputs of irrigated industries

- for communities in irrigated areas.

The discussion that follows aims to separate the impacts of water trading from the impacts of other factors affecting the shape of rural Victoria. It is, however, difficult to make such a separation, and this difficulty reinforces two of the main messages of the report:

- A key impact of water trading is to speed up the rate of change associated with the other factors bringing about change.
- It is thus difficult to untangle the effects of water trading from a background of drought, changing commodity markets and rural adjustment.

### Impacts on the individual irrigator or farm

The authors conducted a series of interviews in the case study regions with irrigators and the broader community, to discuss their experiences of water trading and its impacts. Part Two of this report details these individuals' experiences and perceptions.

At the farm level, water trading allows farmers to make decisions about managing their water in a way that was not possible before trading was introduced. Rather than take steps each season to manage the water made available to them through the allocation process, farmers can earn cash from selling water instead of

applying the water to crops or they can buy additional water at the market price. Alternatively, a farmer can choose not to buy or sell water and to simply manage the farm using the allocated volume of water.

The interviews confirmed that all three of these behaviours are evident in farmer participation (or non-participation) in the temporary water market:

- *Selling surplus water.* 'I'll continue to utilise the surplus water either for on-farm production or, if the market's available to trade it temporarily, I'll just take advantage of that. But I've certainly got no problems utilising it mainly as a temporary seller where there is value in doing it ... If you handled your water well, watched carefully, you could temporary trade off your water at the end of the season when you're virtually finished with it, and it's a nice little earner.'
- *Purchasing additional water.* 'I've still got to buy water—no issues with that this year. I'll probably still have to buy 400 megs minimum, just to get the vines through.'
- *Abstaining from the water market.* 'I gave it to [the environment] last year. I gave them 50 ML and left 15 ML the year before because that's all I had left. And whatever I have left at the end of the season I don't sell it, I give it to them.[Some farmers] do the same old thing if they have 25 ML or 200 ML ... [they do] the same thing every year because that's what they have always done. The bottom line doesn't really come into it.'

In the absence of a water market it would not be possible for an irrigator to sell at the market price the water not applied to a crop. In this instance, two scenarios are possible:

- The additional water would continue to be applied to the crop—and presumably earn less for the farmer than it would have on the market, given that it would have been sold if trading were possible.
- The additional water would have been left in the river or in storage. This suggests that the possibility of water trading has led to using the water resource more fully. There is much

literature discussing the activation of previously unused water rights (see, for example, Tisdell et al. 2001) as well as the river management and environmental consequences of all allocated water being used (for example, van Dijk et al. 2006) and the increased risk of over-allocation of the water resource.

Among the consequences for individual irrigators are the following:

- flexibility in production decisions
- management of cash flow and debt
- risk management
- impacts on other irrigators in the region.

### Flexibility in production decisions

If farmers were not able to enter the market and buy additional water in a given irrigation season their planting decisions would be different for both annual and perennial crops. For example, in the case of perennial plantings farmers would need to plan for significant crop loss if there was an allocation shortfall, rather than knowing that such a shortfall could be redressed by paying for additional water volumes.

Activity in permanent water markets is not so much a reaction to annual surpluses or shortfalls—such as through weather variability and allocation levels—but is more linked to helping manage changing production decisions, farm cash flow and risk. Permanent water has been tradeable in its own right since water ownership was unbundled from land ownership. Nevertheless, many permanent trades occur when a farm is sold as a 'going concern', which encompasses both the land and the water.

Changing production techniques on a farm—be it in irrigation technology or the crop planted—is an expensive exercise that also has consequences for water requirements. Appels et al. (2004) found that investment in 'water-saving' irrigation systems is not made purely for the value of the water saved; rather, these capital investments in physically water-efficient technologies increase crop quality and yields as well as being more labour

efficient. The value of the water saved can, however, be part of the decision to invest, with this value being realised if the water can be traded. Changing the crop on a given area of land can increase the water required per hectare above the volume that was initially granted as an entitlement—for example, redeveloping from vines (which use 5–6 megalitres a hectare) to almond trees (which use 12 megalitres a hectare) in the Sunraysia region, which originally had an entitlement of about 9 megalitres a hectare. Water trading enables the water requirements of the new crop to be secured; otherwise, water from one section of the farm would have to be borrowed to water the new crop or the development would not occur.

## Management of cash flow and debt

The argument that the trade in water entitlements gives farmers flexibility to manage cash flow and debt is somewhat contentious. Selling the water entitlement while keeping the farm land provides a mechanism for immediately reducing debt, but it means temporary water must be relied on to keep farming in the future, which may not be a feasible long-term strategy:

*A good farmer has always had the ability to put his water on the temporary market; a bad farmer if he sells his permanent water won't be able to buy it back.*

*... depends upon the individual level of debt. If they haven't got much debt then just keep your permanent allocation, but if they have ... see a lot of people have been forced to sell off surplus water because of their high debt levels and poor returns.*

*That's one of these water things: you bag the blokes that sell it until it gets personal and then you are glad you can do it.*

Nevertheless, depending on crop type, some see the substitution of permanent water for temporary water as a legitimate farm business strategy. If water demand is flexible year to year (interruptible versus non-interruptible) water is required only in years when it is relatively cheap. For example, irrigators of annual crops (such as annual pasture, melons or vegetables) said

in interviews that their production would occur only in years when the water price is relatively low (such that the temporary price is 3.5 per cent of the entitlement price) and not in dry years such as 2002–03 or 2006–07 (such that the temporary price is 15–30 per cent of the entitlement price).

The pressures on cash flow and debt are not always linked to farm management ability because many farms are family farms. For example, one irrigator sold part of his water entitlement to fund his daughters' education:

*My daughters were due to go away to school. And I couldn't find the funds to send them. And I believed there was no point in 10 years' time saying, 'Well now I've got the money — now you can go to school'. I sold a couple of hundred megs to put them through school. So I was a most reluctant seller ... but it was something I did for the girls at the time. It was my aim, one day, to buy it back, but that is a vision that won't be realised the way things are going.*

Apart from the water trading opportunity, other mechanisms to fund his daughters' education would have been to increase the level of farm debt (a new loan or increasing an existing loan) or to sell a portion of the family farm (land and water).

## Risk management

Managing the risk associated with variability in water supply has become increasingly important in recent years as allocation percentages have fallen below 100 per cent in some years (as well as reduced expectations of sales water volumes). Water entitlements are seen as a hedge against reduced allocation levels. By purchasing additional entitlements, irrigators with highly inelastic water demand (say, a basic need to keep vines and trees alive) can protect themselves against the need to buy additional water allocations on the temporary market in dry years, when the price is highest.

The incentives for the farmers' buying and selling of water were put succinctly by one irrigator:



*In the broader scale of things—taking drought out of the equation—in terms of water trade, it cannot be lost sight of that this is a market-driven exercise and it is mainly willing buyers and willing sellers. There is no pressure, other than economic pressure, put directly on people to sell or buy their water.*

Droughts are short-term crises and water allocation trading can help farmers manage at such times, but water entitlement trading solutions can have long-term consequences. Trade allows farmers to sell water to manage cash flows during dry times, but their ability to buy water in the future is not guaranteed. The flip side to this is that water entitlement sales during the height of a drought might yield higher prices, and there is the possibility of future wet years when either allocations and/or entitlements might be cheap. In dry periods, if farmers have incentives to sell water rather than produce, then less fodder is produced and the price of feed substitutes for dairy herds increases.

### Impacts on other irrigators in the region

From the perspective of the individual irrigator, the flexibility water trading gives other water users can have detrimental effects. A farm has neighbouring properties, can share water delivery infrastructure with other irrigators in the area and competes with other farms producing the same output, and when water trade is possible they also compete with other farms for the use of water. These interrelationships mean that the actions of one irrigator can affect other irrigators. For example, if a neighbouring farm sells its water permanently the block might not be adequately maintained and thus come to pose a disease or weed risk; further, the burden of maintenance of the water delivery infrastructure will fall to the remaining irrigators. Another example is if water is bought by a new farm: this is negatively viewed by some irrigators, who see the produce of the new enterprise competing with their own produce.

Water trading can also have implications for channel capacity and the timing of water deliveries. In general, if water is traded out of a region and is no longer used on properties in the area,

congestion in delivery channels is eased. If water trades into a region there will be increased congestion. In Sunraysia, for example, people interviewed spoke of the reduction in river flows reaching Mildura when the private diverters upstream turned on their pumps.

## Impacts on irrigated industries

At the industry level, water trading enables industries to react faster to change and to contract or expand. In the absence of water trading, other inputs to production could be increased or decreased in response to industry change, depending on the time frame, which in turn depends on the type of input:

- Farm consumables—such as fertiliser, seed, pesticides and herbicides—can be managed responsively in the short term, with a stockpile or inventory kept or additional supplies ordered.
- Farm labour can be adjusted in the short term through altered hours by existing workers or through contract labour. Some labour skills are industry specific; others can be more generally applicable.
- Farm capital can be adjusted in the longer term by new investment or running down existing assets. Capital from one industry application may have limited value for use in other industries.
- Land—and the associated bundles of water—can be adjusted in the long term to move to a different production system.

Tradeability makes water more akin to being simply another farm consumable whose use can be adjusted in the short term, as opposed to the long-term adjustment of land–water bundles.

Water trading is also a catalyst for industry change: it allows irrigation of land that has not historically been irrigated. This has been observed, for example, on greenfield sites in the Sunraysia region. These sites can start afresh on a large scale, with block layouts and irrigation in accordance with best practice at the

time—this knowledge can be almost directly applied from elsewhere in Australia or overseas where that type of crop is being grown under similar conditions—and farmers managing their own water delivery infrastructure through pumping directly from the river. In contrast, to develop a new horticultural crop such as almonds on blocks in an existing irrigation scheme that are at the time growing grapes is more expensive because it entails buying many properties, the expense of demolishing or working within the original block layouts, and reliance on a purpose-built design and shared water delivery infrastructure that may not meet the crop's needs. In this way water trading facilitates a response to the economic stimuli provided by commodity markets, taxation arrangements, and local and global demand.

With or without water trading, the face of any irrigated industry would have changed during the past decade because there have been changes in the mix of inputs that are used in best-practice irrigation farming. For example, capital intensity has increased with a number of advances:

- laser levelling—which has become more prevalent in flood-irrigated districts
- machine harvesting—which is now more widely used in horticulture
- pressurised irrigation delivery technology
- increased monitoring and sensor use
- increased mechanisation—as with dairying technology.

Uptake of such innovation has been prompted by the increases in yield and quality and the labour- and water-saving characteristics of the technology. Even without water trading, these water savings are of value because they permit the irrigation of a greater farm area, yet water trading means that an additional option is available—that of selling the water for cash, either temporarily or permanently. As a result, water trading could make some of the investment decisions associated with increasing capital intensity marginally more attractive.

Increased capitalisation has also meant that the average farm size has grown in keeping with larger unit sizes in farm production—such as the area of vines a harvester can pick in a given time, the area of crop that can be managed by one worker, and the number of cows that can be milked each day. Water trade has little impact on the drivers of farm aggregation.

In a system where water is linked to land, reduced water availability can mean a proportional reduction in the amount of water available to all types of crops. In a connected system, however, a variety of crops can be farmed, and this proportional reduction is not a very efficient distribution of the available water. For example, applying less water to annual crops will reduce yields or the area planted, whereas applying less water to perennial plantings might reduce current yields as well as putting at risk the survival of trees and vines and reducing yields in future seasons.

Water demand differs between industries, which brings with it differing reactions to risks in water availability. Additionally, different industries have different options available to them for substituting for water use to some degree. If water can be traded, some crops can be grown opportunistically, with annual plantings varying according to water availability; in contrast, perennial plantings have relatively fixed water demands from year to year. In extremely dry years water entitlement holders who generally grow annual crops can find that they would earn a better return from their water allocation by selling their water rather than applying it to their crops. Farmers with perennial crops are willing to pay higher prices to buy additional water for their crops and so avoid catastrophic loss of their permanent plantings.

This means that in the absence of water trading it can be expected that an irrigation system with a given security of supply would be dominated by an industry (or industries) whose characteristics of water demand complement the characteristics of the water supply. This has often been put forward as an explanation for the distinct historical differences between irrigation practice on either side of the New South

Wales – Victoria border: more opportunistic crops are grown on the northern side, which traditionally has less security of water supply, whereas the southern side is dominated by dairying and horticulture.

Another impact of water trading is that the trade provides a means for industries with different demand characteristics to co-exist efficiently in the same irrigation system (with a given level of supply security). For example, an industry based on a crop with consistent water demands can develop in a system with low security of supply because it can secure the additional water it requires in years of low allocations by buying water on the temporary market or by holding increased amounts of permanent water. Alternatively, water trading makes it more feasible for more opportunistic crops or industries to be developed in a system with a highly secure supply—as observed with melons, which are now a cash crop in Sunraysia. This flexibility to reallocate water is the primary benefit of the water trade. Peterson et al. (2004) found that water trading in dry years could offset half the production losses (gross regional product) that would have otherwise occurred.

## Specific industries

Following is a summary of how the main irrigation industries in the case study regions have been affected by water trading. At this industry level, it is difficult to separate the impacts of water trading from the drivers of water use and trading described in Chapter 3.

### *Dairying*

The analysis in Chapter 3 suggests that without temporary water trading the dairy industry would have fared much worse than it did during the past 10 years of drought. Temporary trading allowed dairy farmers to buy water when it was needed or to sell their annual allocation on the temporary market and offset increased expenditure and/or production losses. Data on water

trading in the case study regions show that the Goulburn–Murray Water regions, which have a high proportion of dairying, have recently begun selling permanent entitlements but have also been buying temporary entitlements.

As discussed, the trade also facilitated growth and restructuring in the dairy industry in response to changing market conditions and deregulation.

Permanent trading meant that farmers who left farming did so with more money than they otherwise would have. It is thought that until 2003–04 the total irrigated area for dairy production did not decline significantly. (More recent data on land use are not available.) Any declines in the area of irrigated dairying in the case study regions are likely to be constrained by the annual limits on permanent trade out of particular districts.

### *Horticulture*

Permanent water trading has allowed horticulturalists to secure the future water demand of new plantings on land that was not previously irrigated. Growth in permanent entitlements in the Sunraysia region, as shown in the trade data, is almost entirely for growth in the horticultural industry, much of it on greenfield sites. It is therefore expected that without permanent trading there would have been very little large-scale horticultural development in Victoria in the past 10 years. For example, in the absence of permanent trading, the wine boom would have been confined to existing irrigators switching away from dried fruit, and the almond boom might not have occurred since that industry is heavily reliant on economies of size.

Further, without temporary trading many existing horticultural enterprises in the Goulburn system would not have survived the extraordinarily low seasonal allocations. Many mixed farms survived those allocations by selling water on the temporary market, making more money than they would have done by growing crops.



## Mixed farming

Mixed farming enterprises tend to produce the lowest returns for water input and are therefore more likely to sell water in times of water scarcity. They thus accounted for the majority of the early trade in permanent entitlements, especially from small to medium-sized enterprises. Mixed farming enterprises are particularly common in the Pyramid–Boort and Kerang–Cohuna regions. In the absence of drought, when seasonal allocations are high, temporary trade into these regions could be expected to be higher.

## Related industries

Industries such as agricultural services, farm supplies, and machinery sales and service are affected by expansion and contraction of the irrigated industries they supply. The Centre for International Economics analysed the contribution of irrigation to the Australian economy and to employment in 1996–97: it found that, although the direct contribution at the farm level represented just 0.65 per cent of gross domestic product, the total contribution of irrigation, taking into account all indirect effects, is 2.33 per cent of GDP (CIE 2004).

Irrigated agricultural industries provide the input for processing industries and have flow-on effects. For example:

- The direct contribution of all Australian irrigated agriculture to GDP was estimated to be \$3446 million in 1996–97, while the indirect contribution to GDP of irrigated food and fibre processing was \$2521 million and the indirect contribution to GDP of flow-on effects was \$6420 million.
- Irrigation was also found to provide a large number of jobs, both directly and indirectly. Direct employment in irrigated agriculture was estimated to be 28 900 full-time equivalents, while indirect employment in irrigated food and fibre processing was 19 700 and in other indirect irrigation employment 122 400 (CIE 204).

It is the accumulation of direct and indirect effects that results in local economies' dependence on agriculture. One person who was interviewed said, 'There's no doubt a town like Rochester relies on the farming community. If the farmers have money they spend it and everybody benefits from it. As soon as things go bad the farmer shuts up shop and everybody feels the effect'.

As discussed, in the absence of water trading there are ongoing pressures for change in irrigated industry. This means that the demand for services, farm supplies, and machinery sales and service is not static. If water trading speeds up irrigated industries' response to various pressures, industries that are directly related will find demand for their goods and services fluctuating more readily.

When water moves between farms, industries and regions, so does the use of other farm production inputs. Were the water being reallocated between similar uses associated with a similar mix of inputs and were these inputs sourced in a similar way, then relatively offsetting effects (at the aggregate level) could be expected. Were the trade between neighbouring farms, the related industries would not be affected because providers of goods and services generally service specific geographic areas. Were the trade between regions, demand for farm supplies, for example, would decline in one area but increase by a similar amount in the water purchasing region.

If farms that are trading water use different inputs or obtain these inputs in different ways, the impact on industries servicing irrigated industries might be more pronounced. For example, decisions on where to obtain inputs often depend on the size of the 'decision-making unit'—be it family farms or large company farms. Family farms might rely on local service providers for farm inputs such as fertilisers, on contractors for machinery such as harvesters and on local mechanics for maintenance. Larger farms might find it efficient to buy some of these items directly, bypassing the related industries and local suppliers. As one interviewee put it, 'These big companies, what are they buying around here? Nothing! They bring everything in'. Another person observed, however, that this might not always be the case: 'Well, we do a lot of work for large corporate irrigation developments

and that's a key source of our work, which depends on water trade. The scale of developments we are dealing with is huge. So [water trading has] been positive for this business'.

Other industries closely related to irrigated industries are the processors of irrigation outputs. When, for example, the production of milk or hay declines in a region, the throughput of the processing factories is reduced, although it is difficult to attribute this to water trading when there has been a series of dry years with allocations well below traditional levels.

Irrigated activity has flow-on effects for businesses in the surrounding towns by affecting the communities' spending capacity. In the recent dry years dairy farmers have been in a difficult situation, and this affects their purchasing behaviour in town. One project participant noted:

*They used to run on 150–200 per cent water right. And, being electricians, we were servicing their dairy equipment. There would be motor breakdowns or pump breakdowns and things like that, and it started to slow down a few years ago. I can't remember seeing a dairy farmer from that area out there coming into my shop and buying [something that was] not a necessity.*

The impact of water trading might be more difficult to determine since, as one interviewee noted, it is complicated by weather effects as well as a background of small communities under pressure:

*I think it's just a sign of the times. There's really nothing bad that has happened in Boort. There have been a lot of good things happen, but the fact is that the pressure is on small rural communities to survive. People nowadays have fast modern cars they can travel into Kerang, Swan Hill and Bendigo and do their shopping. Most of the businesses that are housed in a small town really have to compete with some of the larger ones in bigger towns, the Better Electricals, the Retravisions, the Targets and all that, and nowadays its just too costly for businesses to stay open. They don't make enough; they don't sell enough clothes in a small town; and they don't sell enough fridges in a small town.*

In this way, the impact of water trading is to be a catalyst for industry expansion and contraction, which affects related industries. It depends on the location of the water movements (and thus the towns and local economies affected) and the types of industries buying and selling water. For example, expansion of labour-intensive industries can bring population increases or their contraction can bring population decline.

## Social impacts in the case study regions

The regional case studies allow for an examination of the impacts of changes in water use and trading on communities. The following sections provide an overview of the socio-economic situation in the case study regions, in order to place the impacts of water use and trading in a broader context.

### Sunraysia

In Sunraysia the trading of water into the district has encouraged economic and population growth and the expansion of irrigation industries. In particular, a number of managed investment schemes have established large horticultural operations in the region. Water trading has also promoted growth in associated industries, although the down side of this is that it has increased competition in the sector. If no trading of water (separate from land) were possible, the investment, employment and regional boom observed in Sunraysia might never have occurred.

This growth has contributed to Mildura becoming one of Australia's 10 fastest-growing regional centres. At present the city has a population of 51 263 and is a major service centre. There are high levels of employment—particularly in agriculture and related industries (much higher than national averages)—and this can be partly attributed to the water trade. Mildura's residents talked about the city's critical mass sustaining and perpetuating the economic and population growth. But Mildura's growth cannot be attributed entirely to the water trade: the growth of regional centres is common throughout rural Australia.

At present drought and a simultaneous downturn in wine grapes, dried fruit and citrus are having a negative effect on the local economy. Water has become a valuable tradeable asset, and a number of smaller operators, mainly in the public irrigation districts, have sold their permanent entitlements to cover debt, retire or leave the industry. This has led to concern about the loss of water from the region and the sustainability of smaller outlying communities.

The other centre of focus in Sunraysia was Robinvale, with a population of 4400. Like Mildura, Robinvale has benefited greatly from water trading into the district. With good soils and climate, this area is the quintessential 'place of higher value use' of water. Several large corporate horticultural operations have become established in the area since the late 1990s, and the town is growing rapidly. It is an exciting place to be because of the economic growth and the perceived unlimited possibilities for horticulture. For the large managed investment schemes and the very wealthy large family businesses in the district, along with some of the businesses that support those industries, water trading has been highly beneficial. Some businesses have benefited more than others. Immigrant workers tend to send a lot of money home and short-term workers ultimately take their earnings with them, which means the local economy is deprived of some income.

Robinvale is experiencing a boom and with that boom has come social structural change. The high labour demands of the horticultural industries have led to a significant in-migration of workers from diverse ethnic backgrounds, which has strained the town's infrastructure and services and created problems for community cohesiveness, including crime. A study commissioned by the Swan Hill Rural City Council (2006) found that the difficulty of obtaining census returns from these in-migrants means that, although the town has an official population of about 4000, the actual population is more likely to be twice that. This has occurred because many casual workers are unlikely to be identified by census collectors and many new immigrants distrust government officials and fail to complete the census form.

## Pyramid–Boort

Pyramid–Boort has experienced considerable movement of water out of the region, which has allowed better management of salinity. In Pyramid Hill, a community of 400 people, the continual loss of water has been accompanied by a loss of farms and production and a consequent loss of people, income and services from the town. Business owners were finding it difficult to compete when people were shopping elsewhere. Returns were depleted because there are fewer people in the district and those remaining have little to spend. Furthermore, transient workers rarely spend their money locally. The residents who tenaciously remain are passionate about their community, committed to sustaining what they have, and deeply concerned that, if water is removed totally from the district, the town will die. To the community's credit, some innovative ventures have been established, among them an abattoir, a quarry, a pet-food factory and Pyramid Salt, a company that is making use of the region's salinity by extracting and marketing salt. There is a social divide in the community, between the large cohort of transient workers and the traditional farming families.

The township of Boort, with a population of 800, is unique in that it has been a big importer as well as a big exporter of water. Some of the better soils in the area provide income from dryland agriculture. Water trade has contributed to Timbercorp establishing a large olive plantation there, which has had positive and negative impacts on the town. Families whose farms were bought by the company have left the district and, although Timbercorp has brought some employment and income to the town, much of its business is conducted outside Boort, leaving many empty shops. On the plus side, the long-established and wealthy farming community that remains is cohesive and committed to sustaining the town.

## Rochester

The smallest irrigation district included in the study was the Rochester–Campaspe Irrigation District, which has been an importer of water for many years, particularly from the Pyramid–Boort region. However, recent trade out of the district,

significant reductions in water allocations (at the time 22 per cent in the Campaspe system) and the consequent loss of productive irrigated agriculture in the district are a major concern for residents. As in Kerang–Cohuna, structural change is occurring in the district, and residents fear the loss of more people from the area.

Rochester, a town of 2600 people, is a service centre for the large dairying community and the site of several support industries. The district is traditionally very wealthy, the economy is totally dependent on agriculture, and drought, deregulation in the dairy industry and water trading out of the region have adversely affected local businesses. A large dairy factory that has long been a big employer in the town recently stood down some workers.

## Central Goulburn

In the Central Goulburn Irrigation District drought was having a big impact on the economies of the towns of Kyabram (population 5500) and Tatura (population 3000). In Kyabram, water trading has led to the establishment of water broking firms and an irrigation supply company, but it has also been associated with the downsizing of an engineering company and the closure of three canning factories in the district. Tatura has not experienced any major loss of industry, although recent declines in local industry practices and employees were a concern.

Water trading has allowed dairy farmers to trade water out of the area, and participants were well aware of the negative impact this trading can have. Because Kyabram and Tatura are close to the regional centres of Shepparton and Echuca, an increasing number of hobby farmers have moved in as the traditional farmers have moved on. This is a concern for the loss of production, for the social structure of the communities and for the environment.

## Kerang–Cohuna

For many years water has traded out of the Kerang district and this has alleviated the salinity problem in the area. The balance

of dryland- and irrigation-based industries contributes to economic stability. Crops are doing well, confirming that the land in the area can be very productive if farms have access to water. The town has a population of 4000, and its central business district and industrial estate are impressive. The industrial area in particular is growing, with some substantial industries supported by an enthusiastic and proactive council. Most of the growth is independent of the water trade, although the trade has allowed the council to facilitate the development of horticultural businesses such as the Brown Brothers vineyard and a cherry orchard. Drought and the sale of permanent water entitlements, on the other hand, are seen as contributing to a loss of farms and people from the community. The sight of previously productive farmland now dry and often in poor condition was demoralising for residents. In particular, the flight of young people from the district was a concern for almost every person interviewed, despite this being characteristic of most rural communities (ABS 2003).

Nearby Cohuna, a town of 3000 people, is set in beautiful surroundings on the Murray River, adjacent to Gunbower Island. The town has been built around a long-established dairy industry, and the residents display a high degree of attachment to place. They perceive water trading to be a threat to the stability of local industry and ultimately to their town as more water is traded out of the region and more dairy farms are sold. To sustain the town's economy, community leaders were looking to tourism and encouraging retirees and sea changers to move to the area. Residents feel helpless in the face of the changes that are happening. There was an awareness that some adjustment might be necessary, but people were sad and resentful that this was the case.

## The social effects of water trading

The heterogeneity of rural communities was evident in the idiosyncratic nature of the effects of water trading on each of the case study communities. One health service provider noted the degree to which services needed to be tailored to each community within a district:

*To quote John Humphreys from Monash University, 'When you know one community you know one community', and for each of our communities their issues are their issues. Within that context, the way in which community identity, their sense of belonging and social capital are sustained, maintained and even strengthened is unique to each of those communities.*

There have been differences in the way the communities have coped with these changes. The following effects were observed.

### *Rapid structural change*

Rapid economic development can lead to the boom-and-bust cycles that are so familiar to Australian agriculture. In Mildura, water trading had facilitated development in wine grapes, but the current glut in the market, which has coincided with downturns in citrus and dried fruits, has resulted in the loss of some smaller operations. Fortunately, Mildura is a large city with a diverse economy and can withstand such changes.

A number of large corporate horticultural operations have been established in Sunraysia, and a direct consequence of this is that Robinvale is facing significant social difficulties as new arrivals flock to the town to meet the high labour demand. This has placed great strain on the town's infrastructure. The other regions were experiencing the effects of water being traded out. Along with the consequences of drought and deregulation in the dairy industry, towns in these regions were losing people as farmers sold their water entitlements and production on their farms declined.

Although water trading offers potential for economic advantages and employment for smaller communities that have few other competitive strengths, these communities lack the resources to survive economic downturns and are less able to diversify. Further, small communities are ill-equipped to cope with the social disruption that accompanies rapid economic growth. For example, the large number of immigrant workers drawn to Robinvale has strained housing, professional, community and health services and created problems for community cohesiveness, including increasing crime. The community faces a major challenge in accommodating the needs of a diverse

range of people and lifestyles. This is a daunting, and probably impossible, task given that the demands of the mobile population outstrip the capacity of publicly funded resources to provide the necessary services.

Robinvale typifies the process of uneven social development as a consequence of uneven economic development (Furuset 1989). There are concerns that the headiness of the booming economy might mask the reality of how the community would cope with a loss of water and the withdrawal of some of the large corporate operations. Freudenburg (1992) described booming economies such as this as 'addictive' because the initial experience is exhilarating but the long-term consequences can be debilitating. Robinvale does exhibit the main characteristics of a vulnerable community—geographic isolation, imbalances of scale and power in the horticultural industry, and the absence of alternatives for diversification.

### *Community cohesion*

Residents of the case study communities were asked to rate the level of cohesion in their community on a scale of one to five, where one was fragmented and five was strong and united. The mean ranks for the regions were Sunraysia 3.81 (SD .98), Kerang–Cohuna 3.94 (SD .80), Pyramid–Boort 4.07 (SD .59) and Rochester and Central Goulburn 4.09 (SD .54). Rochester and Boort had the highest levels of cohesion because these are older, established farming communities that share similar values and goals. Robinvale residents reported the lowest level of cohesion, mainly because of the presence of large numbers of immigrant workers from diverse ethnic backgrounds. Thus economic and social change associated with water trading affects the social cohesion of communities, which in turn affects levels of social capital—the networks of mutual support, reciprocity, trust and obligation that enable a community to work together (Coleman 1990, Putnam 1993).

### *Depopulation*

For many years economic decline in rural Australia has resulted in towns losing jobs and as a result population and then basic services such as banks, health facilities and schools. People in



the case study regions saw water trading as exacerbating the situation by providing a means for farmers to trade out of debt, retire or leave a district, causing further population losses from towns. Of particular concern is the exodus of young people. According to the 2001 census, there has been a continuous migration of people aged 15 to 24 years from rural areas to urban centres. Between 1996 and 2001 almost three times as many young people left country areas as arrived in those areas—226 net departures per 1000 young people (ABS 2003).

A review of census data for the case study communities reveals a significant decline in this cohort, particularly in places such as Pyramid Hill. Many young people appreciate the benefits of country life, but they often have to leave to pursue further education and employment opportunities (Eacott & Sonn 2006). Young women are much more likely to leave than young men, and this results in a marked age and gender imbalance. If economic and social opportunities cannot sustain a critical mass of young people, the means by which a community reproduces itself (marriage, family, and so on) and the demand for vital services such as education and other forms of social consumption break down (Barclay et al. 2007). In some areas, though, these population losses are partly offset by in-migration of people in older age groups. These might be the same people who left 20 years earlier or they might be ‘tree changers’.

### *Social pressure*

The negatives associated with the loss of permanent water from a region have led to some resentment being directed at farmers who participate in the permanent trade. Fenton (2006) found that some farmers have been ostracised by their community for selling their permanent water entitlements. This current study did identify these pressures, but the persistent and intensifying drought has seen a softening of that resentment and a greater appreciation that many individuals may not be ‘willing sellers’. Such behaviour can be explained by the fact that residents of small, integrated communities tend to work out interpersonal agreements for achieving desired outcomes (Freudenburg 1986). Ellickson (1991) maintains that these informal social norms are consistently utilitarian, serving to maximise the welfare

community members obtain in their everyday interactions with others and to minimise the costs to the community as a whole. As a consequence, some norms can be beneficial to some members of a group and harmful to others. Punishment for those who do not conform can be negative gossip, ostracism and intolerance on the part of other community members. In the social life of small communities, future encounters are often unavoidable.

### *Health and welfare*

Water trade-related loss of people from a region threatens the provision of health services in smaller communities, particularly places such as Pyramid Hill. Once a doctor, hospital or other service is lost, it is extremely difficult to replace. Such losses can also call into question the viability of other services, such as aged care facilities. Service providers in the study regions stressed the importance of maintaining existing medical services because of the implications for the local community if the services close. If people have to travel to seek medical help, more will move away.

One of the consequences of the sale of water entitlements from small properties in the Mildura area concerns service delivery to the large number of elderly people who keep living in the house on their property long after the water has been sold and they have ceased working the land. Legislation prevents people on less than 10 acres (4 hectares) from retaining their house block and selling the remaining dry land. There are concerns for the health and wellbeing of these families who cannot afford to move off the farm. Meals-on-wheels delivery is difficult for ageing ethnic populations who have specific dietary needs. There are fewer volunteers because they have to use their own car, pay for their petrol, and travel large distances to bring services to people on isolated properties.

Water trading also has an impact on the mental health of people in these communities. Service providers said the impacts of drought and water trading on psychological health were entwined. Many were seeking extra counselling services in order to meet the increased demand. Cohuna residents feel a loss of

control and helplessness in relation to the changes being brought about by the trading of water out of the community. Drought also saps energy, and the residents are at a low ebb. The lack of water for gardens and, ultimately, the declining aesthetic appeal of the towns in some of the regions, particularly in the Campaspe area, were dispiriting for residents.

## Recreation

Sport and recreation are a vital part of the social life of rural communities. The current high cost of water and people's inability to keep paying club membership fees have meant that many sporting clubs are struggling to survive—especially those that need large water allocations to maintain their grounds. Golf clubs, in particular, are losing business. School grounds have also suffered, and many school facilities are used by the wider community. Without sporting and social events to bring people together, isolation increases and community cohesion declines (Stark 1991).

The social value of lakes for recreation in the case study regions was very apparent. Little Lake Boort is clearly Boort's greatest attribute and also brings tourist income. The local farmers recognise this value and contribute water to the lake when they can. Water for environmental purposes was appreciated, but it was the social value of lakes for recreation that was of primary importance. Little Lake Boort is also a pivotal resource for country fire brigades: it is the only source of water for helicopters involved in firefighting over a wide area.

## Crime

The level of crime is a strong measure of community wellbeing. Most of the case study communities had low crime rates, and the local police said their communities were made up of law-abiding, hard-working citizens. As a larger centre, however, Mildura experienced more crime, and local police referred to some additional problems associated with the presence of seasonal workers. Pyramid Hill suffered some problems with domestic violence and affray associated with the transient workforce.

Water theft is not widespread, but there have been some big thefts of irrigation equipment from the large corporate horticultural operations. Barclay et al. (2004) found that corporate farms are more likely to be the target of thieves because the thieves consider such operations wealthy and able to afford the loss.

According to social disorganisation theory (Bursik & Grasmick 1993, Sampson & Groves 1989), residential instability, ethnic heterogeneity and income inequality are factors that contribute to low community cohesion and greater social disorganisation and consequently more crime. Unfortunately, Robinvale has all these characteristics, and they are a direct consequence of water trading.

## Socio-economic indicators in the case study regions

The socio-economic data presented in this section come from the Australian Bureau of Statistics census basic community profiles for 1991, 1996 and 2001.<sup>5</sup> Although it is difficult to attribute specific changes to water trading, the data provide an important general indication of socio-economic trends in the case study regions.

### Population

Figure 4.1 shows the change in the population of the case study regions from 1991 to 2001. The most significant change was in Pyramid–Boort, where the population decreased by 11 per cent during the period. Kerang–Cohuna's population decreased by 8 per cent, while the population of the other areas increased by between 3 per cent (Sunraysia) and 6 per cent (Rochester).

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<sup>5</sup> The 2006 census data were not available at the time of writing. Further, the ABS boundaries and the irrigation districts do not exactly align. It is assumed that Sunraysia is represented by the Mallee Statistical Division except for Gannawarra; Kerang–Cohuna is represented by Gannawarra Statistical Local Area; Pyramid–Boort is represented by Loddon North SLA; Rochester is represented by Campaspe–Rochester SLA and Campaspe South SLA; and Central Goulburn is represented by Campaspe–Kyabram SLA and Greater Shepparton B West SLA.



As Figure 2.9 shows, Pyramid–Boort was the region with the largest net transfer of water out, with both permanent and temporary trade moving water out. There was significant selling of permanent entitlements from Kerang–Cohuna but significant temporary trade into the region. The other regions—all with positive population growth rates—had increases in the net amount of water transferred in.

Central Goulburn had a water trading pattern similar to that of Kerang–Cohuna but did not experience a population decline. However, trade out of Central Goulburn was most significant after 2002. If there is a causal link, the impact may not appear in the available population data set. Similarly, much of the growth in entitlements in Sunraysia occurred after 2001. Interviews in Sunraysia suggest that the population has increased considerably, particularly in and around Robinvale.

### Median age

Figure 4.2 shows that the median age of people in each of the case study regions is notably higher than the median for Victoria as a whole. It is also rising steadily, particularly in Pyramid–Boort and Kerang–Cohuna, where the median of 40 years in 2001 was five years higher than the Victorian equivalent. An ageing population might have been a contributing factor in decisions to sell permanent water entitlements.

### Percentage of the population aged more than 65 years

Figure 4.3 shows that the proportion of the population aged more than 65 years has been increasing in all the case study regions. In each region the percentage is higher than that for Victoria as a whole, a pattern that would be expected in all rural areas. Pyramid–Boort (18.4 per cent in 2001) and Kerang–Cohuna (17.8 per cent) have the highest proportion of their population over the age of 65 years. Again, ageing farmers might be more likely to sell water permanently.

Figure 4.1 Total population, by case study region, 1991 to 2001

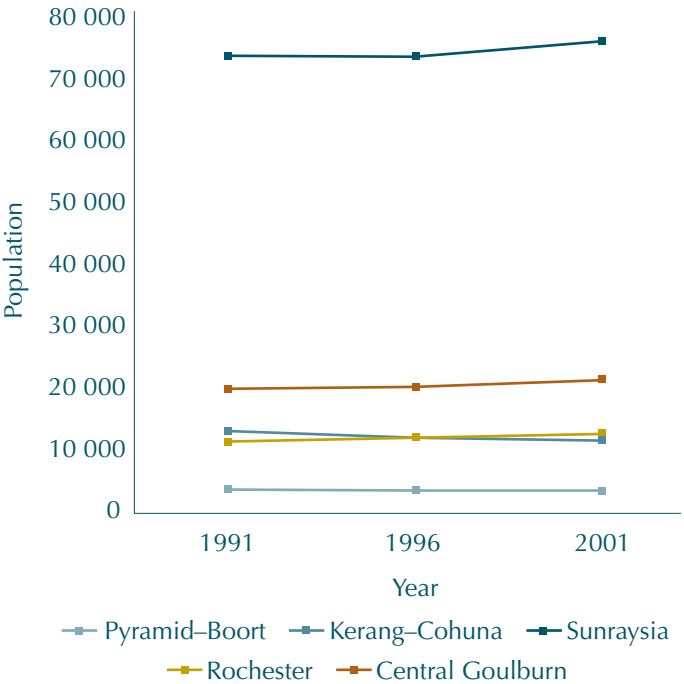
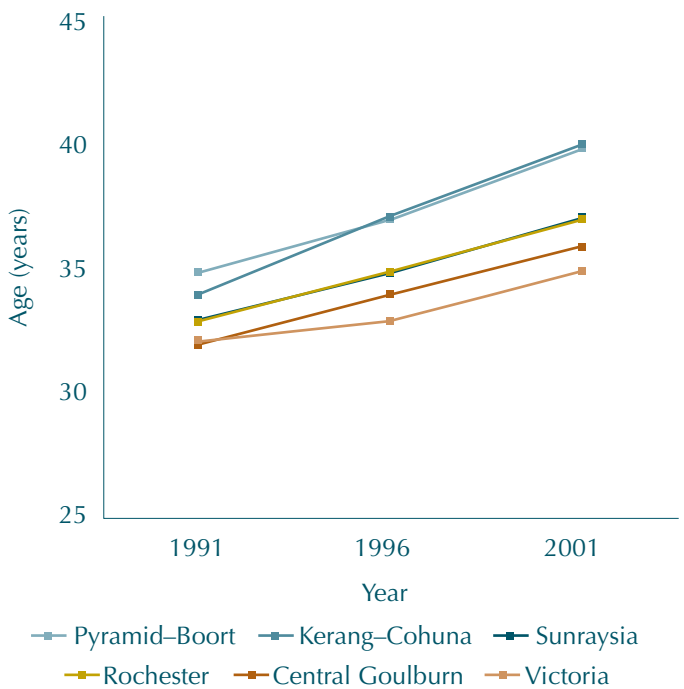
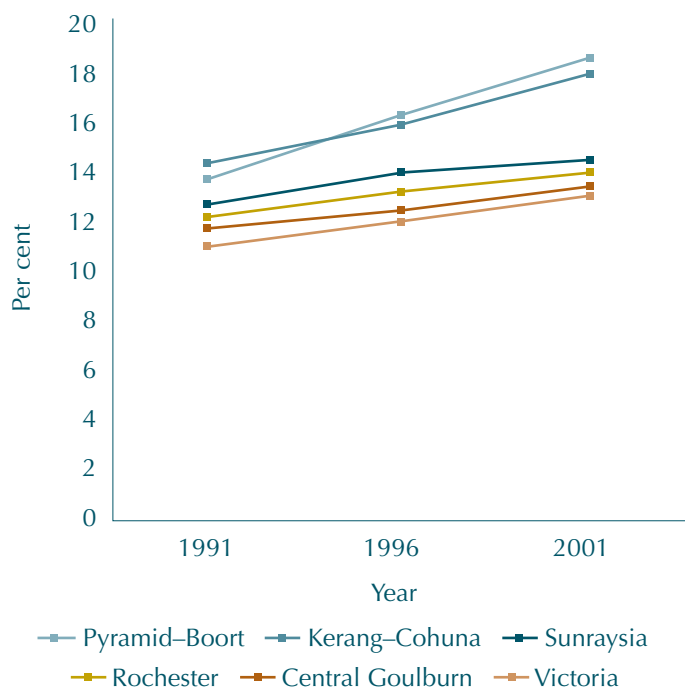


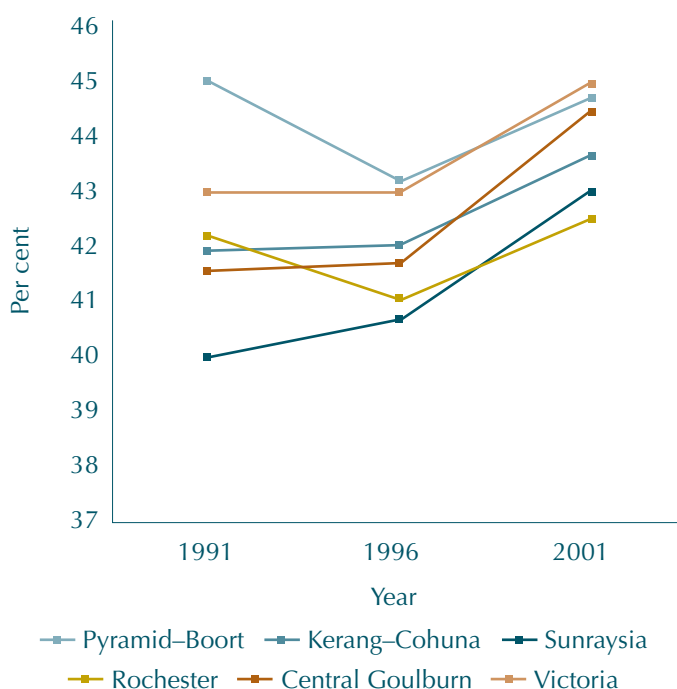
Figure 4.2 Median age, by case study region, 1991 to 2001



**Figure 4.3 Percentage of population aged over 65 years, by case study region, 1991 to 2001**



**Figure 4.4 Percentage of the population in employment, by case study region, 1991 to 2001**



## Percentage of the population in employment

Figure 4.4 shows the proportion of the population in employment in each of the case study regions. In each region in 1991, 1996 and 2001 the percentage is lower than that for Victoria as a whole—except for Pyramid-Boort, which had a much higher proportion of employed people in 1991, although this had fallen significantly by 1996. In Sunraysia the proportion of employed people increased from 40 per cent in 1991 to 43 per cent in 2001.

## Percentage of employed people working in agriculture, fisheries and forestry

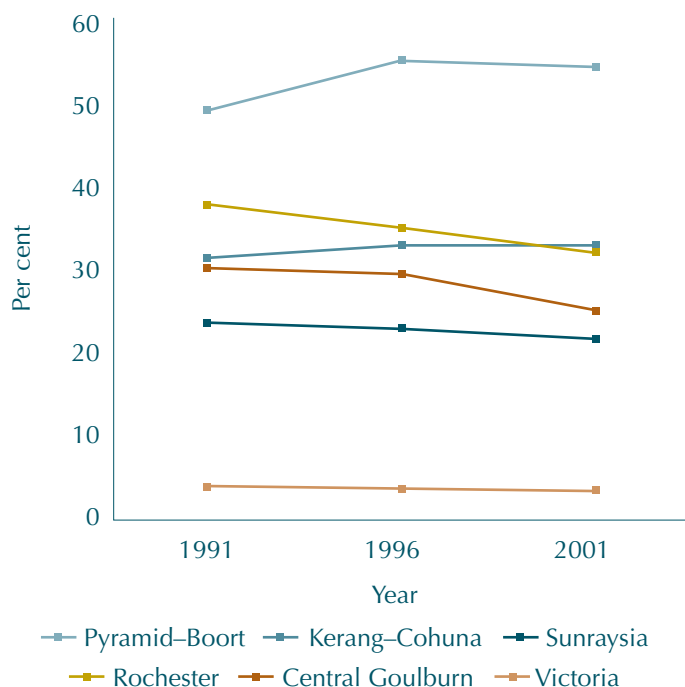
Figure 4.5 shows that the proportion of people employed in agriculture, fisheries and forestry in each of the case study regions is much higher than the proportion for the state as a whole. Generally, the percentage is declining in each of the case study regions, with the exception of Pyramid-Boort

(between 1991 and 1996), which also had the highest proportion (54 per cent) in 2001. The Australian Bureau of Statistics data used to represent the Sunraysia region include Mildura, a major regional centre: this probably explains much of the difference between Sunraysia and the other regions.

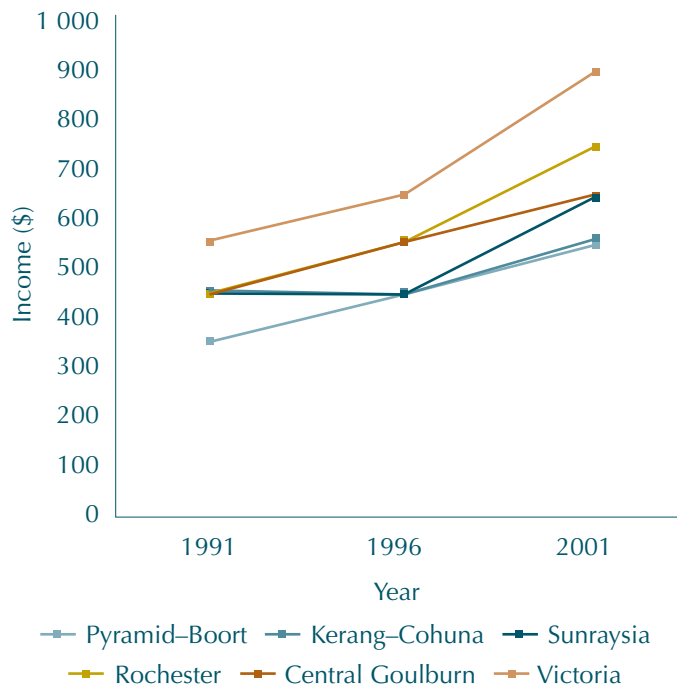
## Median weekly household income

Figure 4.6 shows that the median weekly household income in each of the case study regions has increased over time but is much lower than the Victorian median. Despite—or perhaps because of—significant water trading out of Pyramid-Boort, that region's median weekly household income has increased significantly, from a low base of between \$300 and \$399 in 1991 to \$500 to \$599 in 2001. Incomes in Sunraysia increased greatly between 1996 and 2001, from \$400–\$499 to \$600–\$699. By 2001 Rochester had the highest median weekly income compared with the other case study regions (\$700–\$799).

**Figure 4.5 Percentage of employed people working in agriculture, fisheries and forestry, by case study region, 1991 to 2001**



**Figure 4.6 Median weekly household income, by case study region, 1991 to 2001**



## Separating the effects of trade from other causes of change

Separating the effects of water trading from other causes of rural change requires a counterfactual: how would decision making and outcomes in the various regions be different in the absence of water trading?

The effects of water trading are difficult to separate out because the alternative—what would have occurred in these regions if the water trade were not possible—is unobservable. In addition, the communities in the study are subject to the pressures that affect many rural communities in Australia:

- drought
- the vagaries of international markets
- falling commodity prices

- the high price of fuel
- deregulation of the dairy industry
- the ‘disappearing middle’—the decline in the number of farms, leading to a polarisation between larger holdings and smaller or hobby farms
- loss of services and declining populations in rural towns—particularly the loss of young people.

Although drought and the declining number of farms were common to all the regions studied, the type and extent of the other impacts just listed varied between the regions at the time this work was being done (2006–07). Mildura was feeling the negative effects of falling commodity prices for the wine grape, citrus and dried fruit industries. The exodus of young people was particularly evident in Pyramid Hill, Boort and Kerang. In Tatura and Kyabram local economies were affected by the towns’ proximity to large regional centres.

One indication of what would have happened in the absence of water trading is gained by looking at the total amount of water reallocated through trading. As discussed in Chapter 2, total water reallocated through trading is calculated by summing the change in available water through allocations to traded entitlements and the change in available water through temporary trade in allocations in a particular year. The often offsetting effects of temporary and permanent trading have led to increased water for irrigation use in the Rochester, Central Goulburn, Kerang–Cohuna and Sunraysia regions, while reducing the water used in Pyramid–Boort. As noted, the study regions (in aggregate) have been net importers of both temporary and permanent water. The total water reallocated through trading has increased in aggregate across the five regions.

In the absence of water trading, expansion in certain activities and regions and adjustments in others would have been much more difficult. For example:

- The expansion of horticultural industries in Sunraysia would have been constrained in the absence of water trading. Had inter-regional water trade not been possible, the alternative for greenfields developments would have been even more water being traded out of the pumped districts—leading to more acute social disruption in these areas. Had no trading of water (separate from land) been possible, the investment, employment and regional boom observed in Sunraysia might never have occurred.
- Many of the districts studied are highly reliant on dairy farms, which were under great pressure during the 2002–03 drought. With or without water trading, drought leads to tough times and property foreclosures. At this time water trading gave the dairy farmers the option of buying in water to supplement their allocations, rather than prematurely drying off their herd or substituting to stockfeed other than irrigated pasture. Decisions to maintain production did, however, lead to considerable debt being accrued. Water trading out of these dairying areas is a mechanism for clearing some of this debt and, although it is seen as detrimental to the local community, the alternative for managing the debt would have arguably been even more detrimental, with impoverished farm families,

fire sales of assets and bank foreclosures. Water trading delays and prevents some of these sales by giving farms an additional asset with which to manage debt.

Although it is difficult to untangle the effects of trade from the background of drought, by considering observed outcomes and possible actions in the absence of trade, this study found as follows:

- Without temporary trading, the dairy industry would have fared much worse during the past 10 years of drought.
- Even with temporary trading, many dairy enterprises collapsed in the extraordinarily low seasonal allocations of 2002–03 and 2006–07. Permanent trading meant that those farmers left farming with more money than they otherwise would have had.
- Without temporary trading, many existing horticultural enterprises in the Goulburn system would not have survived the extraordinarily low seasonal allocations.
- Many mixed farms survived the low seasonal allocations by selling water on the temporary market, making more money than they would have by growing crops.
- In the absence of drought and with high seasonal allocations, the volume of temporary trade into regions such as Pyramid–Boort could be expected to be higher.

Although it is also difficult to untangle the effects of trade from the background of structural adjustment, this study found as follows:

- Water is trading permanently out of areas with small farms and closer settlement—for example, Mildura and Tongala.
- New developments mainly occur outside constituted irrigation districts because of the advantages for developing greenfield sites and the difficulty of achieving economies of scale on the small blocks in some irrigation districts.
- Without permanent trading, there would have been very little large-scale horticultural development in Victoria in the past 10 years.

Again, although it is difficult to untangle the effects of trade from the background of commodity markets, this study found as follows:

- Without permanent trade, the wine boom would have been confined to existing irrigators who switched away from dried fruit.
- The almond boom might not have occurred since almond growing is an industry heavily reliant on economies of size.
- There will be less water available for temporary trading back into dairying areas as current plantings of vines and trees mature.
- Changes in the relative prices of commodities are likely to alter the patterns of trade.

The difficulty of separating out the effects of water trading from other factors was also evident in the community consultations and interviews. Persistent drought has caused a downturn in local economies and the loss of people from communities. From the interviews, it seemed that residents consider that water trading exacerbates the impacts of drought in regions that have been selling water entitlements. Few, however, could rate the impact of water trading on their community in relation to other influences; those who did tended to rate the impact of water trading as relatively low. Several of the participants observed that if there was good rain nobody would be particularly concerned about the impacts of the water trade.



## 5. Findings and conclusions

The purpose of this study was to ‘ground truth’ the assumed benefits of and perceived concerns about water trading by examining the experience of three regions in the Victorian Murray Valley—Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna.

### The advantages of water trading

In broad terms, water trading in the Victorian Murray Valley follows the postulations of economic theories of trade and investment:

- Water trading improves the capacity of different parties to react to changes in circumstances.
- Permanent trading has allowed horticulturalists to secure the future water demands of new plantings on land that was not previously irrigated. The trade in permanent entitlements has assisted the development of new industries such as the wine industry and new horticultural developments in Sunraysia. This promotes economic activity in the region, bringing increased employment and investment.
- Water trading facilitates flexible risk management and farm decision making, including the decision to leave agricultural production. Temporary trading in water allocations has helped with risk and financial management for dairy farmers in northern Victoria, who, because of drought, have endured 10 years of low seasonal allocations, including extraordinarily low allocations in 2002–03 and 2006–07.

- Water trading in a system that has both annual and perennial crops gives farmers flexibility in decision making about their priorities for water use, as well as a means of risk and cash flow management, particularly in dry times. It also facilitates business growth and development.

### The potential disadvantages of water trading

The economic and social impacts identified in this study are generally consistent with what would be predicted from rural sociology theory relating to communities exposed to rapid structural change associated with boom-and-bust cycles in agriculture:

- Water trading has posed management challenges for irrigators in industries where price and marketing risks were previously regulated and production risks were managed by conservatively run irrigation systems.
- Water trading can have negative effects on local communities. There is strong community opposition to permanent trading out of a district. Some farmers have been ostracised by their community for selling their permanent water entitlements. With persistent drought, however, there is a greater appreciation that many individuals could be selling unwillingly.



- The social impacts in these regions are not simply a temporary phenomenon associated with the introduction of water trading: rather, they are likely to be a permanent feature of regional economies exposed to the rapid shifts—facilitated by water trading—in investment between different types of irrigated agriculture.
- Although water trading by entitlement holders is voluntary, the trade also affects third parties. Trade into a region can lead to increased competition in production, queuing for delivery of irrigation water, and higher water tables. Trade out of a region can lead to increased water delivery charges to remaining users (the ‘stranded assets’ problem), the build-up of disease and pest plants and animals, and depopulation.
- Change and adjustment can be difficult. Communities in regions exporting water can experience reduced populations and less spending. Communities in regions importing water can experience increased populations without necessarily having the infrastructure and services to accommodate the new arrivals.
- Service industries—such as agricultural services, farm supplies, and machinery sales and service—are affected by the growth and contraction of irrigated industries through water trading. Not only does demand in these industries depend on whether water is moving into or out of a region: it also depends on the types of farms water is moving to and from.

## Conclusions

- To understand the water trade, it is necessary to consider permanent and temporary trading together. Both types of trading affect water use in a region, and there is often an offsetting direction in observed temporary and permanent trading.
- Water trading prompts change that would in any case have happened as a consequence of other forces for change in rural economies—such as drought, commodity markets and rural adjustment—rather than being, of itself, the primary force for change.
- It is difficult to untangle the effects of water trading from the background of drought. Any approach implying that all impacts associated with changes in water use facilitated by trading are *attributable to* or *caused by* water trading would be misleading and unhelpful for policy development.
- Future changes in commodity prices will affect prospects in different industries and the pattern of water trading.





## Part Two

### The regional case studies



## Case study A: Sunraysia

### Introduction

This case study is one of three studies to form part of a project examining the social and economic impacts of water trading, with the objective of informing policy in this regard. The project focuses on regions where water trading is prevalent—the irrigation districts of Goulburn–Murray Water and Lower Murray Water, on the Victorian side of the Murray. In particular, it seeks to quantify and report on, through the case studies, the actual impacts of water trading on individual water entitlement holders, industries and communities in the Murray Valley, in order to test the assumed benefits and perceived concerns arising from the trade. The information examined was collected through a series of interviews and consultations in the case study regions, involving irrigators and the broader community.

Apart from Sunraysia—including Mildura, Merbein, Robinvale, Red Cliffs and private river diverters—the regions studied were Pyramid–Boort and Rochester, Central Goulburn and Kerang–Cohuna. Much of the material presented for the Sunraysia study reflects local people's views about their experience of water trading, rather than the authors' views and analysis, which are presented in Part One.

This case study is structured as follows. After a brief description of the Sunraysia region, the pattern of water trade into and out of the region in the past decade is described. Focusing first on irrigated agriculture, the study then

examines the main forces—irrigation history, institutional settings and the changing fortunes of particular products and industries—affecting this water trading and the costs and benefits of the trade, predominantly from the perspective of those in the affected industries. The study then looks at the experience of those in the major centres of Mildura and Robinvale, again largely from the perspective of the people interviewed. The main lessons from the case study are brought together in the concluding summary.

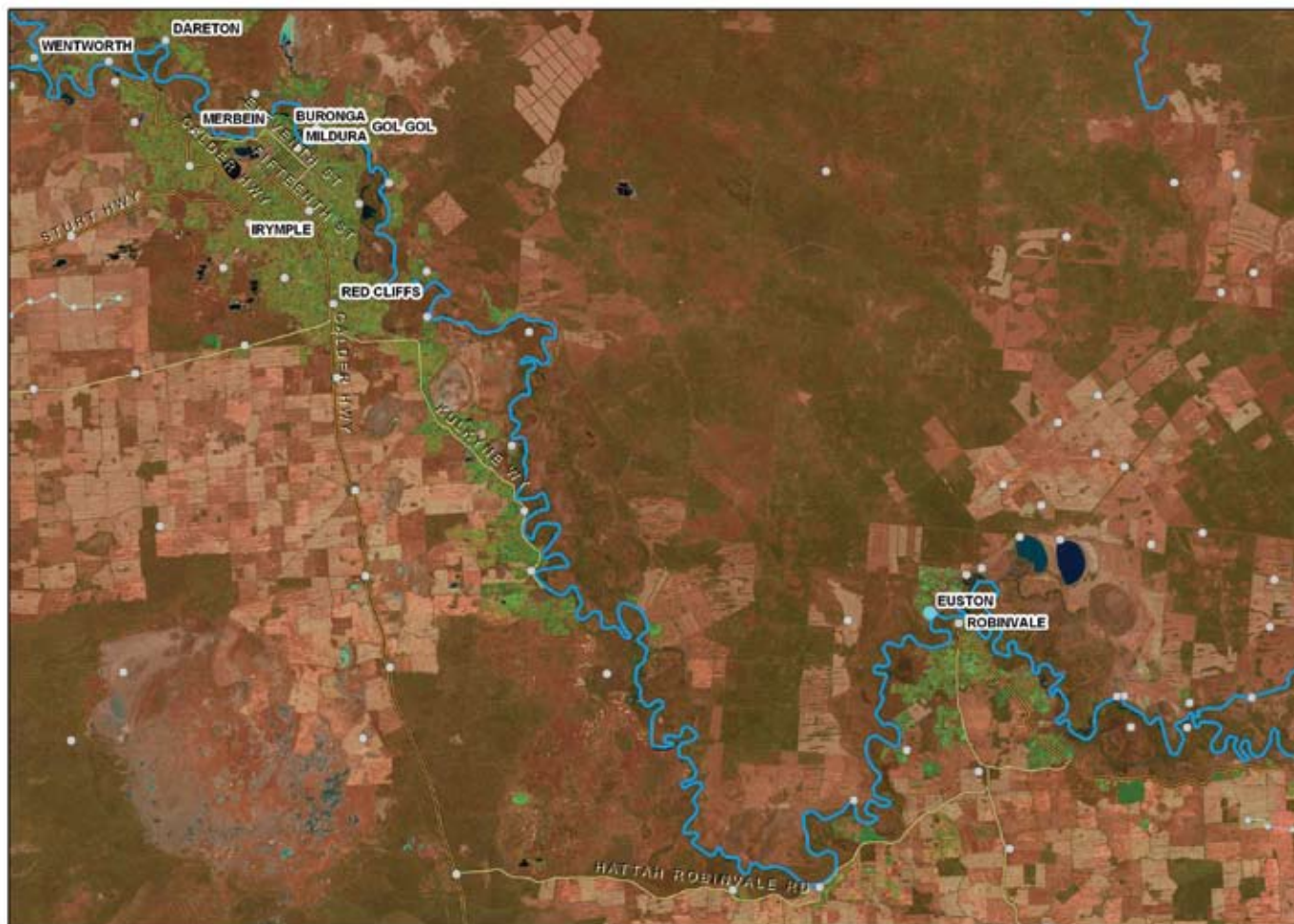
### Location

The Sunraysia Irrigation District is bounded by the Murray River from Nyah to the South Australian border, a river distance of about 770 kilometres. Lower Murray Water and the First Mildura Irrigation Trust pump river-quality water for irrigation and domestic and stock supplies and provide a subsurface drainage service to about 3600 customers in the region. It is a diverse horticultural region, with dryland cropping in the outlying areas. Mildura is the main centre. Other sizeable communities are Red Cliffs, Merbein and Robinvale.

### Patterns of water trade

The Sunraysia region has been increasing (net) temporary water allocations out of the district while purchasing permanent water entitlements. Although this behaviour differs





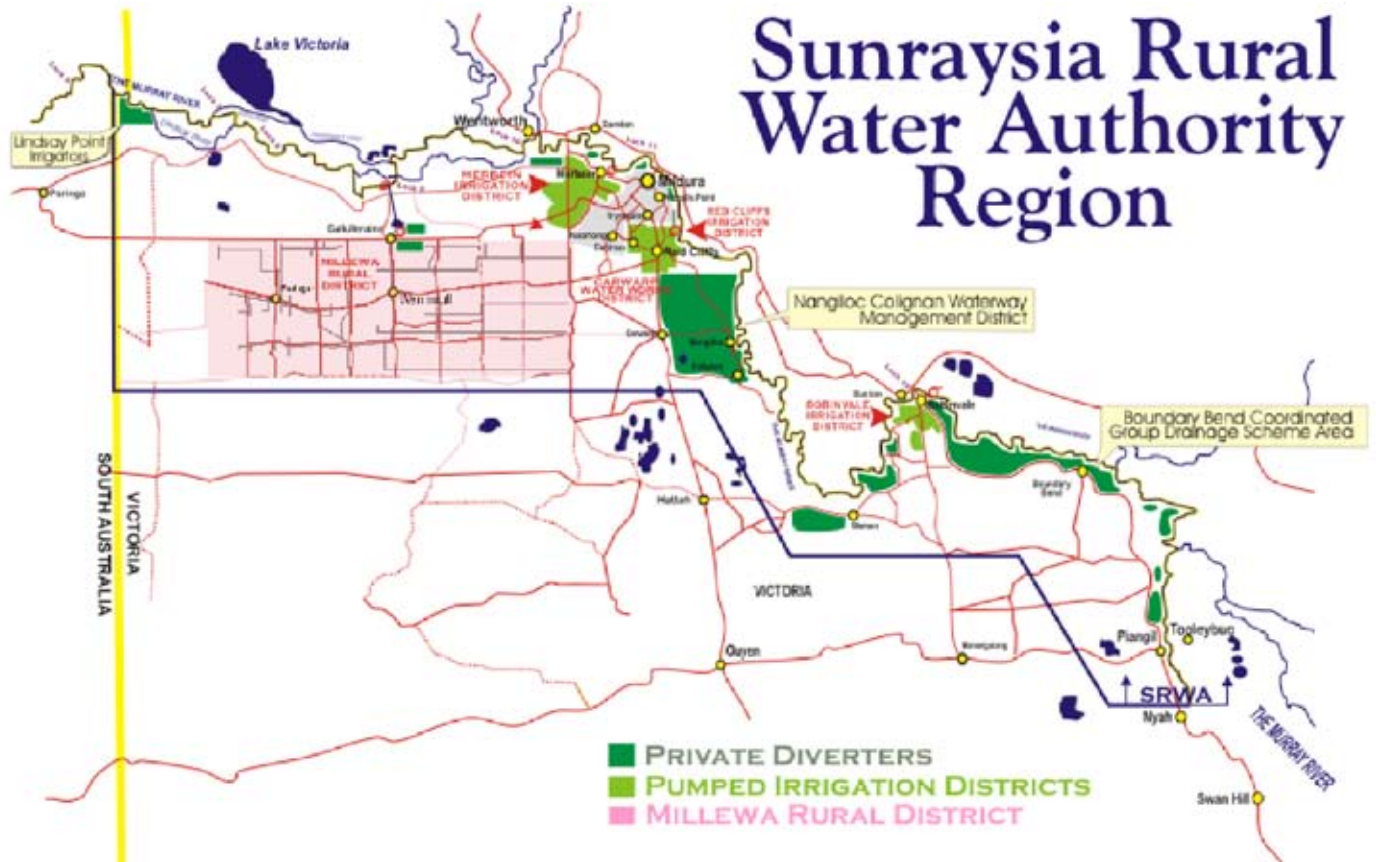
Source: Murray–Darling Basin Commission

from that in the other case study regions, the timing of the increased activity in permanent water markets is similar: the past three irrigation seasons, from 2003–04 to 2005–06, have seen a marked increase in purchased volumes (compared with the increased selling observed in the other regions in these years). The consistent inflow of entitlements has dominated the temporary trade outflow effects to give an overall positive net transfer of water when all the water reallocated through trade is considered (see Figure A.1).

Aggregation of data to the Sunraysia regional level hides some movements of water that are occurring in the region, which consists of a number of pumped districts—Red Cliffs, Robinvale and Merbein—and private diverters.

There is a strong positive correlation in water trading movements for the Merbein, Red Cliffs and Robinvale sub-districts. There was little temporary trade from 1995–96 to 2001–02, then a spike in sales of temporary water in 2002–03, of about 5000 megalitres in Merbein and Red Cliffs and about 1000 megalitres in Robinvale. This spike in sales is associated with the drought year, when the Goulburn system's seasonal allocation was only 57 per cent. During 2003–04 to 2005–06 these districts sold temporary water at a roughly constant annual rate of 2000 megalitres in Merbein and Red Cliffs and 475 megalitres in Robinvale.

# Sunraysia Rural Water Authority Region



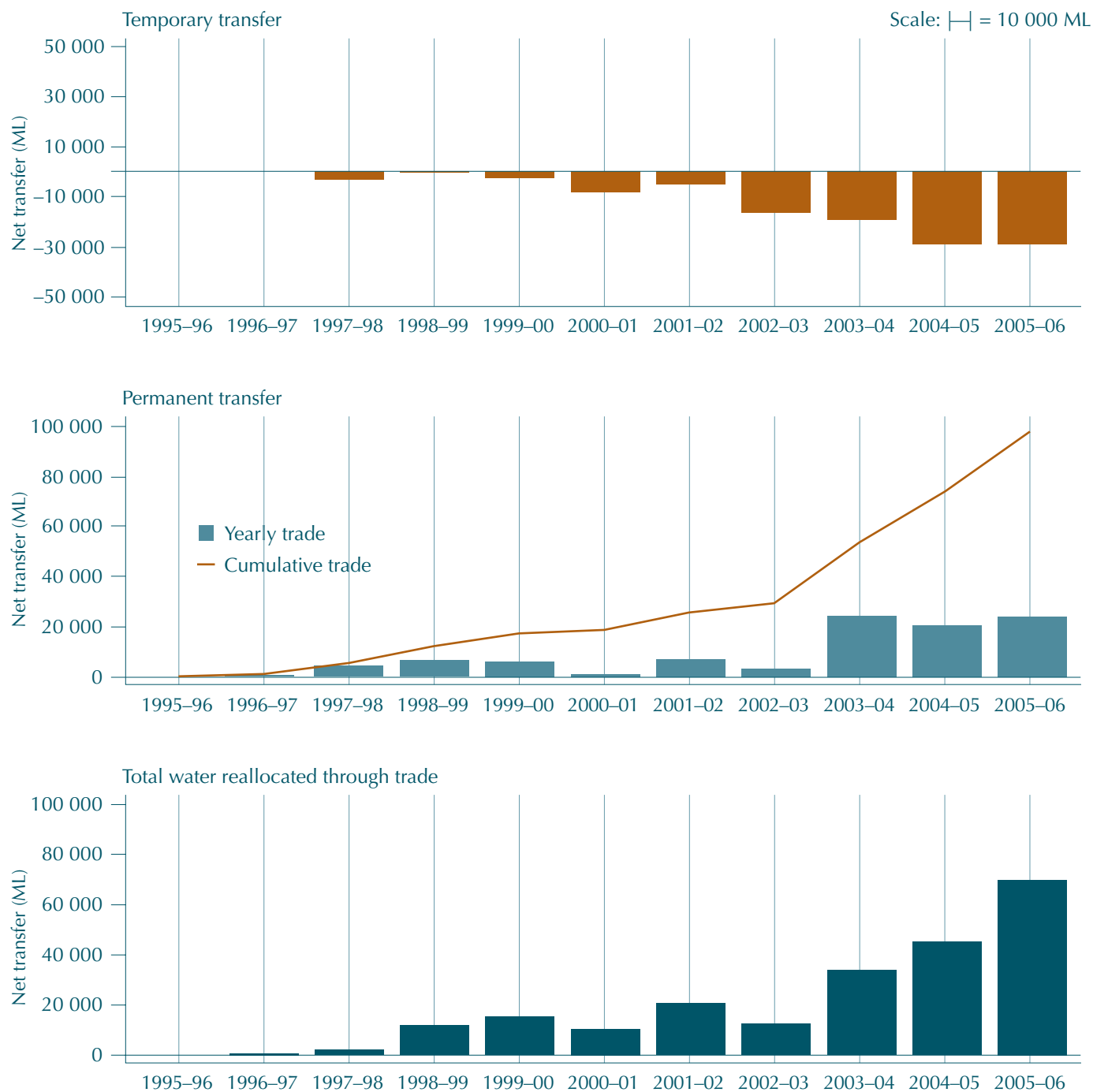
Source: Sunraysia Rural Water Authority.

There has been much less activity in permanent trading. All three districts have been buying and selling permanent water in very small amounts, and there is no general trend. The largest volume of permanent water traded by the three districts in any irrigation year occurred in Red Cliffs in 1995–96 (–2363 megalitres). This in fact is a significant deviation from the average trade of about –190 megalitres. Since 1995–96 all three districts have been net sellers of permanent trade, as indicated by their cumulative amounts in 2005–06. By 2005–06 Red Cliffs had traded out 4000 megalitres of permanent water, and Merbein and Robinvale had traded out 1700 and 64 megalitres respectively.

Apart from the temporary trade in 2002–03, water trading by private diverters (on the Murray below Nyah) accounts for the great majority of the water traded in Sunraysia. This


is supported by Figures A.2a and A.2b, which show that the values for this district and the Sunraysia total are often very close together. The amounts of water traded in and out of this district are large relative to all other districts in the region, which is why this district has a big influence on the total value of water traded in and out of Sunraysia. Temporary trade out of the district steadily increased from 2000–01 (7820 megalitres) to 2004–05 (25 000 megalitres). It then decreased slightly in 2005–06, to 24 400 megalitres. Interestingly, permanent water transfer occurs in the opposite direction; this is the only district of Sunraysia that is a net importer of permanent water. There was a small bout of permanent water purchasing activity from 1997–98 to 1999–2000 and in 2001–02, with amounts at about 5500 megalitres a year. This was dwarfed by permanent

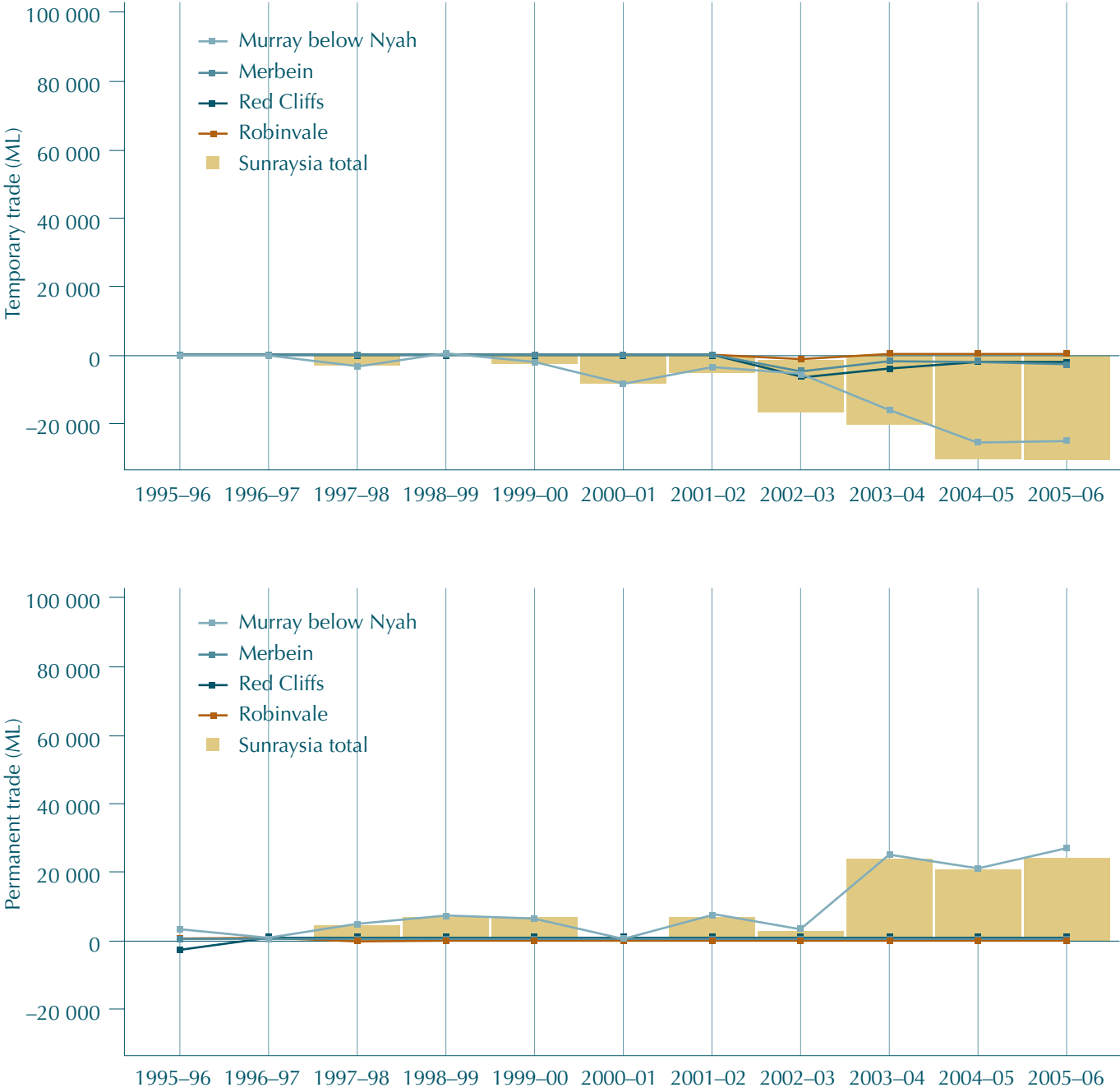
Figure A.1 Sunraysia water trading, 1995–96 to 2005–06



Sources: ACCC (2006); Lower Murray Water annual reports; Sunraysia Rural Water annual reports.

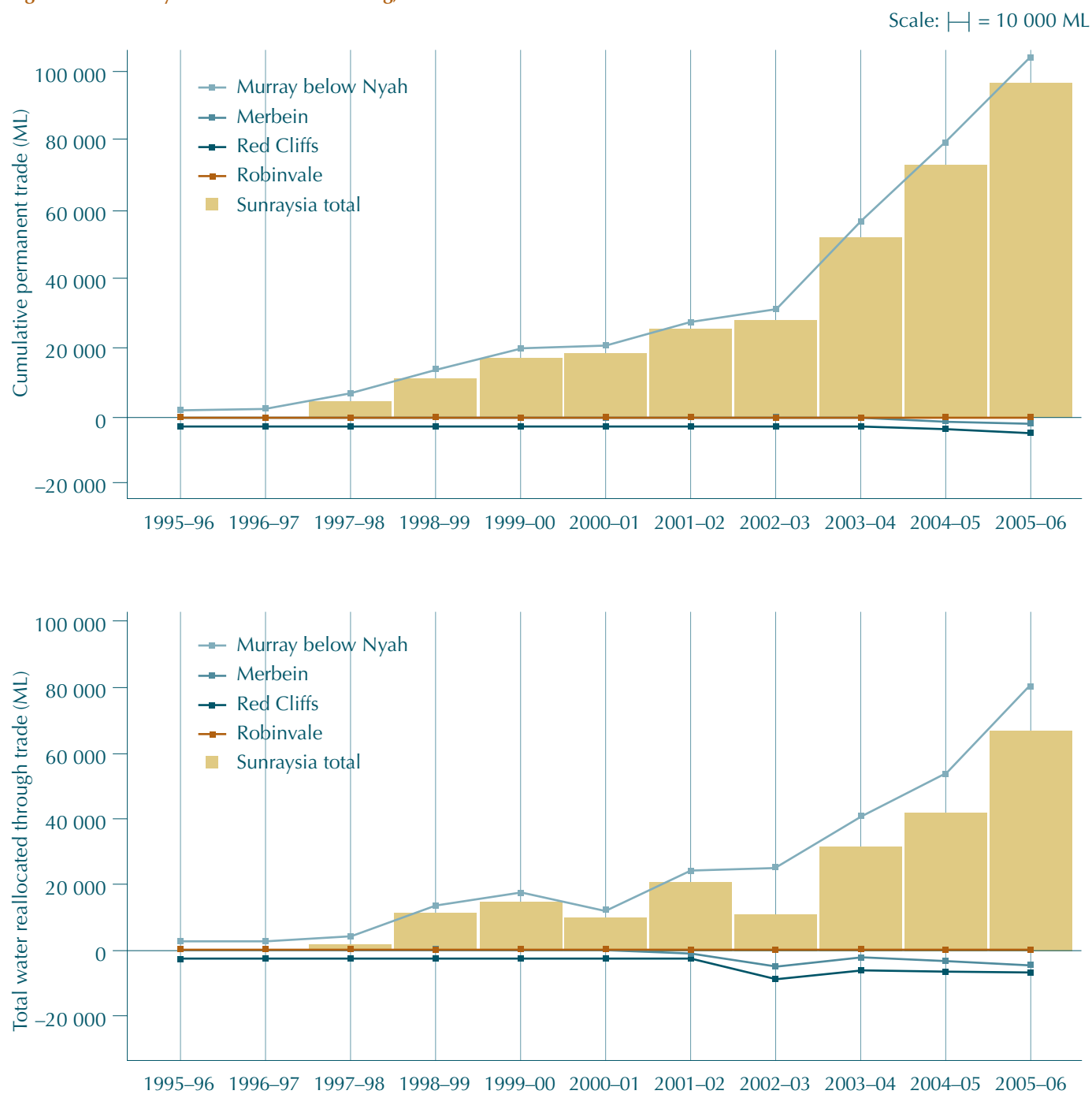
Figure A.2a Sunraysia districts water trading, 1995–96 to 2005–06

Scale:  = 10 000 ML



Sources: ACCC (2006); Lower Murray Water annual reports; Sunraysia Rural Water annual reports.

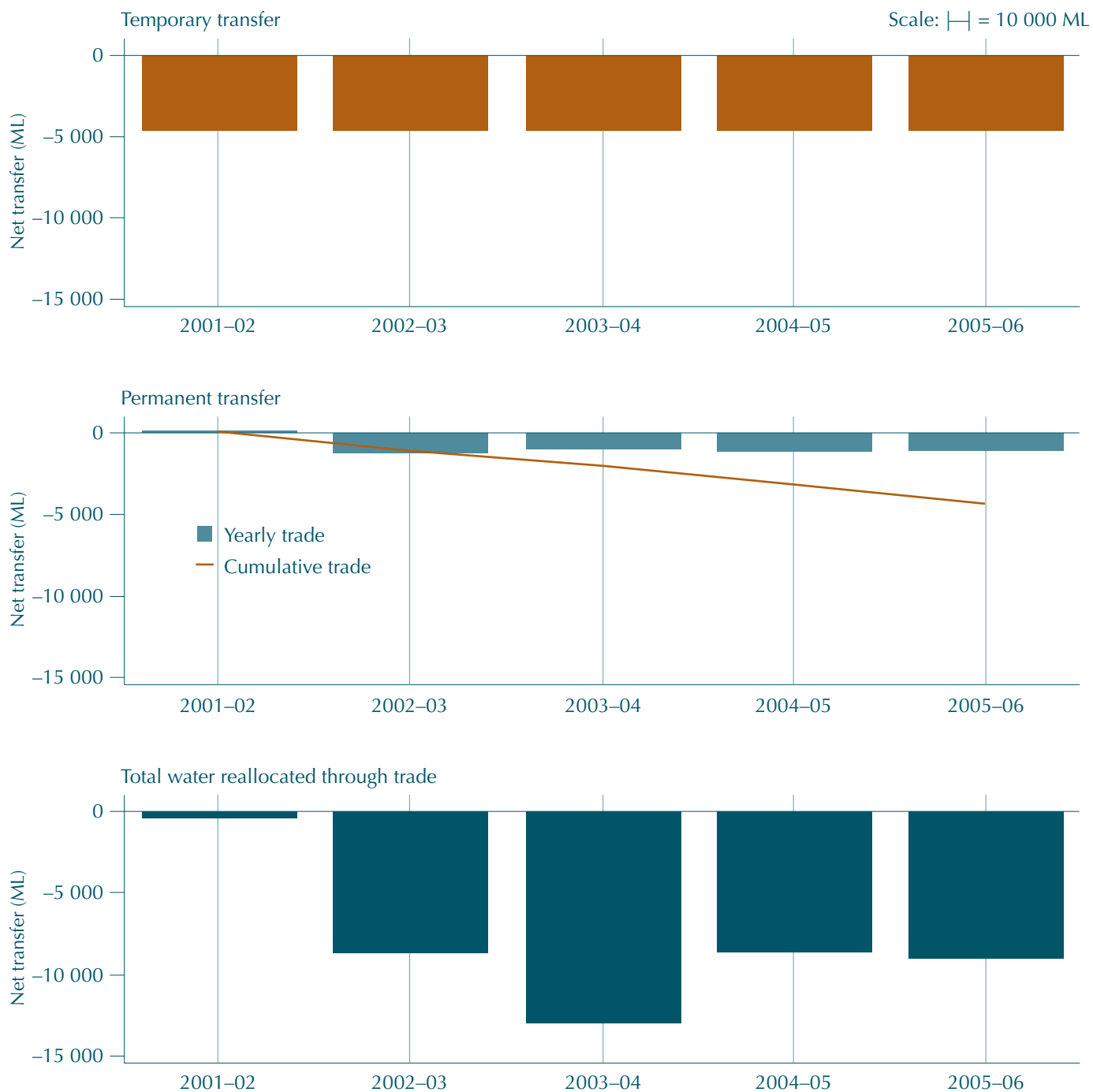
Figure A.2b Sunraysia districts water trading, 1995–96 to 2005–06



Sources: ACCC (2006); Lower Murray Water annual reports; Sunraysia Rural Water annual reports.



**Figure A.3 First Mildura Irrigation Trust water trading, 2001–02 to 2005–06**



Sources: ACCC (2006); Lower Murray Water annual reports; Sunraysia Rural Water annual reports.

water trading from 2003–04 to 2005–06, when about 24 000 megalitres was bought each year. This trend is also made clear by the cumulative trade values, which show a steady increase during these periods. By 2005–06 more than 100 000 megalitres of permanent water had been traded into this district. Overall, permanent water trading outweighs the effect of temporary trading—evident in the positive amounts of total water reallocated every year since 1995–96.

The First Mildura Irrigation Trust also manages water in the area (see Figure A.3). It began permanent and temporary trading in mid-December 2001 and in both types of trade is a net exporter of water. Temporary transfer out of the district peaked in 2003–04, at about 11 000 megalitres. In 2004–05 and 2005–06 temporary trade out of the region was about 5000 megalitres a year. A steady 1100 megalitres a year of permanent water has been traded out by the First Mildura Irrigation Trust since 2002–03. The constant negative slope in the cumulative permanent trade line accentuates this trend. The combined effect is a net transfer out of about 8750 megalitres in 2002–03, 2004–05 and 2005–06 and 13 000 megalitres in 2003–04.

## Key drivers in irrigated agriculture

### Irrigation history

In 1887 the Chaffey Brothers' Mildura Irrigation Company established irrigation infrastructure and helped to finance settlers at Mildura. An expanse of 100 000 hectares of irrigation was envisaged, but the company collapsed in its infancy and its affairs were taken over by irrigators who formed the First Mildura Irrigation Trust. The next spurt in irrigation development came in 1910, when a dairying settlement was established at Merbein. Irrigation districts were established after World War 1 and World War 2 at Red Cliffs and Robinvale respectively (VMSWQ 2006). From the 1950s the widespread availability of electricity and improvements in pumping technology meant that new irrigation developments were centred on individual enterprises, which could pump their own water from the River Murray (VMSWQ 2006).

### *Initial distribution of water entitlements*

In the Sunraysia region as a whole land is abundant and water is scarce, but inside the irrigation districts land is relatively more scarce than water. In the irrigation districts most of each property was deemed to be irrigable at the time of settlement. All irrigable land in the Merbein and Red Cliffs irrigation districts was originally issued with 3 acre-feet of water per acre; since metric conversion this has been described as 9.144 megalitres a hectare.

Robinvale irrigators were originally given 7.62 megalitres a hectare (2.5 acre-feet per acre) but, for the sake of consistency with neighbouring private diverters, this was upgraded to 9.144 megalitres a hectare during the Sharing the Murray process in 1996. Legal argument over the exact nature of entitlements in the First Mildura district was resolved by converting them to 9.144 megalitres a hectare during the same process. Upgrades were also made for irrigators with crops requiring large amounts of water—for example, citrus.

Long-term average annual water use by irrigators in Sunraysia is about 7.8 megalitres a hectare, so most irrigators have the potential to be sellers on the temporary market in most years. On the other hand, until the recent drought many of them judged the transaction costs of entering the market to be too high; for example, someone on 4 hectares might have only 5 megalitres to sell. In 2003–04 there were 94 temporary trades of 5 megalitres or less originating in Sunraysia; there were 10 trades of 1 megalitre or less; the smallest parcel was 0.1 megalitre.

Conversion from dried fruits to table grapes or wine grapes allowed some irrigators to bring under irrigation land that was previously set aside for drying greens and racks. Mostly they did this by stretching their existing water entitlements over more land. But for this marginal potential to expand, most district irrigators are landlocked by their neighbours: to expand their businesses they must buy land and water.

Some private diverters—especially those in intensively developed areas such as Nangiloc–Colignan—are similarly landlocked. Others have more potential to expand their business by bringing dryland areas under irrigation.

## *The legacy of closer settlement and soldier settlement*

Water trade has brought into even sharper relief the impact of closer settlement policies on property size in the older irrigation areas.<sup>1</sup> Size matters in horticulture. It matters in agriculture in general, and new irrigation developments relentlessly pursue economies of size. Needless to say, though, not all new developments are successful.

Property consolidation into larger economic units is one of the main ways of maintaining competitiveness in the older irrigation areas, even though it also involves the purchase of redundant assets such as homes, machinery sheds and clapped-out plantings. The other option in those areas is to combine off-farm work with part-time farming. This is an efficient use of resources in economic terms, and economies of size and scale are not a concern in the use of labour once it is fully employed.

These structural adjustment pressures are most acute in the oldest irrigation areas, where properties are small. For example, in the First Mildura Irrigation District the vast majority of original properties covered 4 hectares, including a house, garden, machinery sheds and fruit-drying greens. By comparison, many of the new irrigation developments cover hundreds of hectares.

In the older irrigation areas irrigators who do not have the capital base to embark on consolidation are consigned to blending off-farm and on-farm work. Despite all their hard work, it is likely that the farm's relative contribution to their total income will continue to fall over time. Alternatively, they can sell up and move on, although many defer this decision until they reach retirement age. Some owners of small horticultural properties that are close to growing urban centres choose to hang on in the hope of realising the real estate value of their land once urban encroachment reaches their doorstep.

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<sup>1</sup> There is plentiful literature on farm size, structural adjustment and productivity in Australian agriculture. For a concise account and other useful references, see Keogh (2004).

This process would have happened anyway: it was happening before the water trade began. It is evidenced by the steady increase in property size that accompanied successive waves of closer settlement. For example, in the Sunraysia area standard vineyard sizes steadily increased from 4 hectares in the Mildura settlement of the 1890s to 4–6 hectares in Merbein in the 1910s, then 6–8 hectares in Red Cliffs in the 1920s and 8–10 hectares in Robinvale in the 1940s. Nonetheless, it can be argued that the water trade has accelerated the process.

Many people see the recent changes as a continuation of the long-term trend:

*This is a continuance of the agrarian revolution. The bigger are going to get bigger and the smaller are going to pull out. It's just a fact of life because of commercialism and size of property. Once 30 or even 15 acres of dried fruit was a sustainable area; now I'd suggest 100 acres is the base because of the capital equipment and investment. If you've got a small enterprise you can't afford to perhaps experiment and put drips in or go to greater efficiency. The bigger groups are generally more likely to be thinking forward and to attend courses and be more innovative than the small person.*

Many see aggregation as the key to survival: '... and I think you'll see less people and bigger properties. That's what it's really all about'. This is not to say that getting bigger is a sure-fire way of avoiding getting out. Timing is everything. Decisions are made in prospect, not in retrospect, and they are always made with imperfect information. As one irrigator put it, 'I doubled the size of my property a couple of years ago. I bought because I thought we'd hit the bottom of the market. It turns out we were just on the edge of the bloody precipice. This could easily take me under'.

Urban planning schemes also influence people's decision to leave farming and whether or not this provides the opportunity for others to expand:

*In Mildura you have two water districts. You have an inner ring, the First Mildura Irrigation District and beyond that you have Lower Murray Water. The urban development of Mildura has been encroaching on the First Mildura Irrigation Trust's clientele, and they are traditionally the smaller properties. The FMIT area in general was based on soldier settlement, 10-acre blocks, and what we've got at present is a lot of people who would like to excise the house they live in on that 10-acre block and sell the remaining land. The planning scheme doesn't allow that to happen. You can't excise off unless you have 10 hectares or more. So what is happening is—our concern is that it will happen more and more—is these people, because of the downturn in the value of the blocks, they can't afford to sell the block and buy a house in Mildura and have some money tucked away for superannuation. So ... what they are doing, now that the water is not tied to the land and they can trade it, is sell off their water and stay on their house and have a bare 9 acres or so around them. So our big fear is that with the freeing up of the water market that we may well end up with all these bare blocks around the place until such time as urban encroachment will take up a small percentage of that but there will be more and more of these appearing.*

Different irrigation districts are seen as offering different opportunities and different costs. The result is that there are different degrees of aggregation and redevelopment in different areas. Most redevelopment has occurred in Red Cliffs and Robinvale: 'I don't believe there's been the development in FMIT [the First Mildura Irrigation Trust] yet; Merbein, there hasn't been the same level of re-development or the same sort of consolidation of properties'. The reason may relate to the quality of the supply system:

*I think Red Cliffs had a better water supply [compared with] Merbein, and that's my experience through the irrigation industry. I think generally the actual land is better, soil quality is generally better, there's nice properties at Merbein, but there's a lot of poor ones too, so there hasn't really been the redevelopment ... FMIT have a pretty average water supply system but they have smaller properties—more transaction costs.*

The dearth of dryland properties immediately adjacent to the irrigation districts also influences the amalgamation of properties in the irrigation districts: 'The expansion by the big guys has meant what would have been available land is pretty much gone for the small guy, so a small guy that wants to expand has to go and buy existing irrigation blocks within Robinvale district and Euston and Tol Tol and the other satellite areas'.

There are pros and cons associated with redeveloping in the irrigation districts relative to developing a 'greenfield' site:

*The problem with Merbein is that if you want to be a serious irrigator—which you've just got to— you just can't go and buy a big slab here and get on with it. It took me I think it was something like 26 years to get 75 acres ... The benefit of being in here is that you can do it in more manageable chunks and you don't put yourself at risk as much. But, having said that, the cost of doing it in here is about 50 per cent more than doing it on the greenfield site. You go into the greenfield site and it's just horrendous ... Some guys are buying greenfield sites for less than \$1000 an acre and counting the cost of water to that is, well, you have to put the money up but you can write it off pretty quickly. I paid over \$1200 an acre to clear the vines off the block and I've gone in there with every weed known to man. The only reason you could buy the block was because it was [terrible], and I think I would have spent twice as much money on herbicides and salty headlands that don't grow readily.*

This is not to say that aggregation is the only strategy for maintaining business viability. Part-time farming is likely to be an efficient use of resources, particularly in industries such as horticulture, which have a highly variable demand for labour. One advantage of living near a city such as Mildura is that it offers many off-farm opportunities to ensure that labour is fully employed. One person who was interviewed referred to Mildura's Economic Sustainability Study:

*This is saying that if you are on 15 hectares or below then you'll probably be OK because you generally have access to off-farm income, that you don't need a full-*

time person and you don't need to be on your property all of the time to run your business. So if you wanted to stay on the land and get through this you would probably survive. But I think those that are on 15 hectares and below ... that accounts for 23 per cent of the area but 74 per cent of the businesses. And if they want to in general terms they will get through. If they have 50 hectares or above—and that's 6 per cent of the businesses and 52 per cent of the area, so that is all that Lower Murray Water area out there in that outside circle, which is all large-scale farms. And this report says they will get through also because they have economies or efficiencies of scale and access to capital. What they are saying is those farms from 15 to 50 hectares, which are 20 per cent of the businesses and cover 24 per cent of the area, are the ones that will struggle to get through this and, of those, it is quite possible that 600 may not survive the current circumstances because generally it takes the owner of the property to run the property, so he doesn't have off-farm income and they don't have the efficiencies of scale of the larger properties.

The disappearing middle is an uncomfortable place to be, as a grower remarked:

*I'm sure the only reason I'm still paying the bills only a couple of months late is because I've got critical mass. The downside of it is I can't get any off-farm work because I'm absolutely committed and I've got to pay whatever. But I've automated a couple of pumps which I'm the only one that does any irrigation, about two or three times a night I need to change water and now I've automated that. That helps a bit.*

### *The importance of family labour and management costs*

The scale of a business is often capped by the activity the owner is most reluctant to delegate. Often this is irrigation—particularly if they are using older, unreliable systems or the cost of getting it wrong is high, as is the case with furrow irrigation. Irrigating is a crucial task on the farm.

It must be done well, so in family businesses the property owner often 'does' the irrigating. It takes a great deal of time and can limit farm size (Tim Cummins & Associates 2001):

*I think that the large properties have been pretty efficient. I think you probably average a worker per 100 acres. The initial set-up of it provides quite a lot of work for contractors, but long term it's all about more and more economies of scale. Like, for instance, I've found that, since we are not getting the money we used to, with our own properties we had five full-time people and we had a permanent manager and people who worked for him, and at that stage I was still [working off-farm], so I was completely hands-off. Now I've cut those five people to one part-timer and myself. I've got one guy that does all the tractor driving. I do all the irrigation, all the arranging, whatever, and the harvesting. We get contract people in to contract prune, things like that. We have found that nothing has really changed—like the quality of the blocks and all that—which is very supportive. Anyway, it's good in the end.*

Reliance on one person to do all the essential work can, however, make an enterprise difficult to sell:

*I'm resigned to the fact that if my health was no good I'd have to sell, and we have agreed that it's absolutely no point because it's so complicated to run this, because I've got bits and pieces everywhere. I do all the irrigation. I never let anyone do any water because it's just a critical thing. And so the deal is if I'm crook we are just going to sell it and worry about it after. And it's not going to be easy to sell either, no, not in one unit. No, no you would never sell this as one unit. If I'm healthy we will keep going as long as I can, and if I'm not, well, that's the way it is.*

Corporate farms have generally broken this nexus. They put a strong priority on simple, uniform and robust irrigation systems so that the task of irrigating can be delegated with confidence. They generally adopt systems that are reliable and provide a margin for error. For example, they might insist

on following a calendar or rely on detailed monitoring and reporting; alternatively, they might achieve the same outcome by having sufficient scale to warrant the employment of skilled and experienced staff. Most family businesses have not developed these sorts of systems. Consequently, the area of irrigation that can be managed by the owner effectively determines the size of the business (Tim Cummins & Associates 2001).

### *Trends in public and private water delivery infrastructure*

Immediately before the introduction of water trading, there were about 17 000 hectares of irrigation inside the public irrigation districts (Sunraysia Salinity Management Plan 1991). Outside those districts, with full uptake of sleeper and dozer licences, the potential area irrigable by private diverters was also about 17 000 hectares (Nyah to SA Border Salinity Management Plan 1992). Since the introduction of water trading, the region has been a net importer of water. Most of the new water is delivered to farms outside the irrigation districts through private infrastructure. Now twice as much land is irrigated outside irrigation districts as in them.

The underlying trend has been for water to move out of the region's irrigation districts—especially in the Merbein and First Mildura districts. Even so, significant extra volumes are being pumped through the Red Cliffs and Merbein infrastructure to supply water to newly licensed irrigators just outside the district boundaries. Typically, these irrigators take advantage of spare capacity in the main arms of the supply infrastructure, often by building balancing storages on the farm.

Part of the motivation for the Alfred Deakin Irrigation Project Feasibility Study (SMEC 2001) was to quantify the potential to increase revenue for the existing water authorities—and thereby reduce annual water charges for their customers—by using existing infrastructure or building new infrastructure to attract developers to contract with water authorities for the delivery of their water:

*The Deakin process clearly showed that the technical and economic dynamics had changed since the days of the Chaffey's and the State Rivers and Water Supply Commission, when large centralised pumps and channels were put in first and what was staged was the plantings. What we are seeing now is the private sector working out what they believe to be the optimum annual investment in infrastructure and plantings combined. As soon as there is enough interest in coordinating overall investment to justify investment in infrastructure to service the scale of total development, then there is no longer any argument for government involvement. Insufficient private investment or lack of hard commitments might lead to government carrying the risks, but that is not what is happening.*

Many vocal irrigators thought the Deakin Project would do nothing other than bring in more horticultural competitors. Moreover, from their point of view, the newcomers were going to get a free ride on the infrastructure that the current irrigators were paying for. To make things worse, they believed the newcomers would probably receive a higher level of service than the current irrigators were receiving.

### *Labour intensity versus capital intensity in dominant industries*

The wine grape industry in Sunraysia is capital intensive. The table grape industry is labour intensive. The dried vine fruit industry is in transition from being labour intensive to being capital intensive.

### *Drought management*

At 95 per cent, allocations on the Victorian side of the Murray were not having a significant impact on farm profitability in Sunraysia in 2005–06:

*In the horticulture area rain doesn't have the same significance as it does in the dryland area because all of our water comes down the river and, generally speaking, if it rains it will just give more consistency to*



*the entitlement that is coming down the river. So it probably wouldn't change. The downturn in the market out there in the present has nothing to do with water: it has got to do with market and efficiencies of production.*

The prospects for the next year were not nearly so bright. Irrigators were bracing themselves for of 30 per cent allocations or less.

As a drought response, the Victorian Government had stated its intention to introduce 'carryover', so that irrigators can carry forward any unused allocations from the current season into the next. But carryover water might not be available in the next season because there might not be sufficient water available to cover the losses incurred in actually delivering it. In other words, there was no guarantee the irrigators would actually be able to use the water just because they had carried it forward.

Government also said it would consider using the Minister's power to 'qualify rights' to favour permanent plantings over other consumptive water uses in extreme situations. In 1997 the Victorian Government had made it plain it would not invoke those rights in what was then understood to be the worst-case scenario for the Murray of 60 per cent allocations:



Vineyard, Red Cliffs

*Some people are saying that the market will fail at some point—perhaps at somewhere around 20 per cent—and that if it gets that low they might think that qualifying rights would be the fairest approach.*

*When you have crops that are like vines and trees, they are not yearly crops, they are things that need to be sustained. If you lose a wheat crop it's very disastrous but it's only one year, but if you lose your eight or 10 years of vines or trees you have a huge problem, so in terms of sustainability it's a very serious matter.*

## Institutional settings

### *Penalties for use above the seasonal allocation*

The stiff penalties for using more than the seasonal allocation encourage a flurry of temporary trade at the end of each season to balance water accounts. As one person who was interviewed put it:

*There is a \$1000 a megalitre penalty up here. If you go one meg over you cop a \$1000 fine at the end of the year ... There was a manager who stuffed up so we had a long, protracted disagreement with the water authority. Now we've sorted it out, but it cost me money because he just misjudged or misread, and it's got to the point where I go and physically read them all myself. But, anyway, to balance it up, sometimes it might be 5 megs over so you have to trade in 5, or you may be coming into May and June and some properties there may have more water than they need so they'll actually sell that or trade between properties at the market rate. So one owner will buy it off this owner for whatever the price is on the particular exchange.*

## *The 2 per cent rule*

When permanent trade was introduced the Victorian Government limited total annual permanent trade out of any irrigation district to 2 per cent of total entitlements for the district. The purpose of this '2 per cent rule' was to keep the rate of change in manageable bounds and to ease revenue pressure on the water authorities.

To date, the 2 per cent rule has not been invoked for Merbein, First Mildura, Red Cliffs or Robinvale. Under the National Water Initiative the limit is being increased to 4 per cent.

## *Reconfiguration*

Victorian legislation now provides scope for irrigation districts to be 'reconfigured' to improve their economic efficiency. The pressure for reconfiguration is strongest when water has been transferred away from smaller spur channels and pipelines, leaving small volumes to be delivered at high cost to those remaining on the spur system.

Relative to other parts of Victoria, there is very little pressure for reconfiguration of the Sunraysia districts. Trade in to service properties just outside district boundaries has at least partially offset trade out of Red Cliffs and Merbein.

First Mildura is landlocked, and trade out has until recently been mostly from the core of the system as a result of urban encroachment. First Mildura Irrigation Trust irrigators are less concerned about reconfiguration than they are about the potential for the trust to be forced to merge with Lower Murray Water.

## *Interim delivery shares*

'Unbundling' of northern Victorian water entitlements on 1 July 2007 will result in district irrigators holding delivery shares that entitle them to specified volumes being delivered per unit of time during periods of peak demand for the delivery of water. The delivery shares will also confer on them the liability to keep paying for their access to the delivery system even if they sell their water.

To reflect these changes, access and delivery tariffs have been changed in advance of unbundling. This will help protect the revenue base of water authorities, act as a disincentive to permanent water trade out of the districts, and allow for setting exit fees based on the present value of this revenue stream.

## *Salinity impact zoning*

The Victorian Mallee has been divided into two river salinity impact zones. When permanent water trade started in 1994 trade into the high-impact zone was prohibited, but 'used water' could be traded within the zone. Trade into the low-impact zone from outside the Mallee could proceed only if the purchaser agreed to pay to offset the deemed average river salinity impact of each extra megalitre of irrigation in that zone. This was initially set at a capital cost of \$130 a megalitre, with an ongoing operating and maintenance charge of \$3.30 a megalitre (Nyah to SA Border Salinity Management Plan 1992).

In 2002 the zoning system was revised because most development was taking place in those parts of the low-impact zone where actual river salinity impacts were higher than the anticipated average. As a result, Victoria was in danger of running out of 'EC/salt credits'. The revised system subdivided the low-impact zone into four divisions, and the new offsetting charges were set at \$26, \$65, \$130 and \$260 a megalitre. Most of the development since has been in the L1 division, where the capital charge is \$26 a megalitre.

The system will be revised further after unbundling on 1 July 2007. Irrigators will have an 'annual use limit' specified on their water use licences, and they will be able to 'hold' twice that amount to manage the risk of low allocations. They will have to pay the per-megalitre offsetting charge to increase their annual use limit. They will then be able to buy and sell water permanently or temporarily without hindrance—provided they stay within their annual use limit and their holding limit.

The current situation is less clear. In theory, water can be traded into the high-impact zone provided there is no net increase in the amount of water being used in that zone. In practice, people assume it cannot be traded back in. As one grower put it, 'So I suppose the other thing happening is people who have not harvested their wine grapes, they have basically left them on the vines and there's a lot of vineyards here that have been abandoned this year and the water has been sold. And once the water goes it more difficult to bring back because it's a high-impact zone'.

### Source-tagging

After unbundling, the water shares being used in Sunraysia will be identified as coming from either the Goulburn system or the Murray system. Depending on the season, these different water shares might have different allocations attached to them. The prospect of this change has precipitated much recent trade out of the Goulburn system into Sunraysia. This is largely because allocations on the Murray system have been higher than those on the Goulburn in the past 10 years, and, before unbundling, water traded out of the Goulburn to the Murray was assigned the higher allocations of water coming out of Murray storages. Some of these allocations have then been traded back up the Goulburn system. This will not happen once the water shares are 'tagged' to the source storages.

## Industry concerns

### Dried fruits

The introduction of permanent water trading coincided with the deregulation of the dried fruits industry, and many growers see water trading as having caused the demise of this industry:

*Another casualty of the freeing up of water trade has been the dried grape industry. Traditionally the pumped irrigation districts of the First Mildura Irrigation Trust and Lower Murray Water had a majority of plantings of grapes*

*for drying, with a smaller area of citrus and a few wine grapes. In 1992 Sunraysia produced 90 000 tonnes of dried grapes, a record crop. Today the industry produces 30 000 tonnes, the decline being mainly due to the diversion of sultanas to wineries and replacement of sultanas with wine grapes.*

Other growers believe dried fruits were bound to be in trouble as soon as governments decided to reduce assistance:

*I don't think the large managed investment schemes have caused the problems in dried fruits by any means. Dried fruit was always going to be in trouble once the government said they were going to reduce tariffs and deregulate primary industry and was always going to be competing against low-cost countries. So I don't see that they've had that impact at all ... You've got to look at the history of the dried fruit industry, and it was very much put in place for several reasons. It expanded principally to take up soldier settlers in all the states. It was an ideal vehicle—small-sized properties, large numbers of people, high employment, terrific. But it was never really put in place in response to a market outcome; it was social, economic and whole range of other issues. It was always going to be in a hell of a fight once going back to the late 50s and 60s when we started losing preferential markets in Britain and Canada. It's a credit to the industry in many ways that it survived as long as it did at the size that it did. But it wasn't the dried fruit industry that let the growers down: it was just that, basically, the opportunity in wine and table grapes was a far better use of the land and water. So I guess in some ways it was good timing because the opportunities were there.*

Some large dried fruit developments have taken place since deregulation. These are characterised by their emphasis on reducing labour intensity and their specialisation in producing 'five crown light', the premium grade for which Australia has a comparative advantage. But, as one grower explained, this carries its own risks:

*The property I look after is a big one and it has reasonable contract for five crown light, so it's got a fixed price ... '05 was a good year because we got a lot of that grade. Last year wasn't so good: we were probably \$500 000 down or so because of the rain. We actually got some rain during harvest ... only small rains but they darken the fruit, so it went down to five crown dark [a lower grade] for which we don't have a base.*

## Wine grapes

In a decade wine grapes went from boom to bust in Sunraysia. This was partly because optimism colours forecasting and therefore investment and partly a consequence of the lumpiness of investment in winemaking infrastructure. Quantum increases in winemaking capacity occur every few years. Wineries are keen to contract for grape supply whenever there is a risk of their infrastructure being under-used. The relatively smoother increase in plantings and tonnages means that towards the end of their investment cycle wineries are likely to encounter oversupply:

*Several wineries need a significant cash injection because they are in serious trouble. They're in trouble because, well, they claim it's because the purchase price of grapes is too high, but it's the wineries that pushed the purchase price up, not the grape growers. That's something that you need to be very mindful of. Grape growers did not push fruit prices to the heights that they are or were. Grape growers pushed prices down; wineries pushed prices up. Grape growers pushed them down in a scramble to get their fruit in; wineries pushed them up to get people to invest. Nothing simpler than that. Wineries often contract with serious prices in them to get their plantings in the ground. The price of red grapes went from \$200 to \$400 to \$600 to \$900–\$1200 a tonne in subsequent years and then they crashed after that.*

Contracts with wineries played an important role in underwriting Sunraysia irrigators as they adjusted their way out of dried fruit production. Those contracts gave banks the confidence to lend money for redevelopment of old vineyards:

*With one of my MBA subjects, I did a really detailed analysis of dad's business and looked at equity, looked at revenue over time, and return on investment between 1997 and 2001. So it had taken him 35 years to grow the business to x size, yet in those four years he managed to double his holdings whilst retaining something like 75 per cent equity or something ridiculous, so he creamed it in those good years. Because he was there, he hit the deck running; he didn't cringe like some guys because he was good to his contracts; a lot of guys turned their back on their contracts and chased bigger deals. But he creamed it in those years and then you look at that point where you say you should have cashed in your chips. But that's OK, if you can get through ...*

Contracts with some wineries proved to be less valuable than others:

*You've seen the change that has occurred here with the wine and dried fruit industry. The dried fruit industry is a bloody stamp compared to what it was. But most of those people have had a go again. There's an example of some good social adjustment issues with that movement from dried fruit into the wine industry. The structural problem with the wine industry is not water; it's not whether they are too small; it's really that they have been emasculated from the beginning by these sorts of relationships. And [name] has been at the forefront of that. He actually cancelled contracts last year. He then turned round and backed up and said to those growers that he cancelled contracts, and then he says, 'Well, we'll do a joint venture, you put your fruit in and I'll market it for you and crush it, and it will cost about \$200 to crush it'—which I reckon is about \$50 above what it should cost—'and if there is any money left over we'll pay you'. Now that is really ...*

Many growers are hanging on in the expectation that the wineries will eventually have to take their fruit because wineries need throughput of grapes to maintain their returns:

*It just depends on that supply–demand balance. If they really want the grapes they really have to contract. Because then you get competition for them. That's why, if you can, some of those properties have been lucky*

*enough not being in a contracting phase or trying to get a contract when there is a glut on. You really want to be, when the balance has shifted a bit, because now it's just 'no sir, two bags full, sir' and that's business.*

*If I was a winery I'd be out there securing my supply line because those factories don't run economically if they aren't at 100 per cent capacity ... Somebody said the other day a winery is just a pile of stainless steel on a sandhill. If you've got nothing going through it, if you reduce the volume of fruit going through—say, you can crush 100 000 tonnes and that's the economic working capacity of that winery—if you drop back to 75 000 tonnes that flows right back into the cost to produce a litre of wine. So, by reducing the throughput of the wine you increase the cost per unit of production.*

Market conditions can change quickly—from the glut to increasing prices as a result of frost damage in some areas in 2006–07:

*One of the local suppliers sent a letter around to all growers to say that contracts wouldn't be renewed, and none of these grapes would be needed next year. So I started cutting them off, and now they say, 'We might review that situation; we might be able to take some this year'. So guys have committed to probably \$1500–1880 an acre expense and denied themselves a crop for two years, and that's a \$6–7000 per acre turnaround. So it's very hard to know what to do ... But, on the other hand, guys that were told last year they weren't going to get their fruit in, and they just didn't believe it they thought, 'Here's an enterprise that's got 120 000 tonnes [capacity] and its got all these facilities: they can't not take grapes' and they kept on watering and spraying and all that—and they didn't take any grapes! You can't believe that either. So you have guys making decisions with information at one end of the spectrum and decisions at the other—guys saying, 'Yes, we are going to keep our grapes healthy for sale'—and they both lost out. It's just unbelievable.*

Property size is important for wine grapes:

- *Harvest areas.* In one night a harvester can do 4 to 6 hectares, so this is an important unit size for production.
- *Span of control.* 'The unit size for a fully developed property with no young vines—just in maintenance, spraying and irrigating and fixing the odd broken post—is 50 hectares per person with a tractor and spray cart, and so on.'
- *Spreading risk.* It is important to grow different varieties: 'If you don't and one variety goes down you have nowhere to go'.
- *Labour requirements.* 'You don't need as much labour on a big wine grape property as you do a little one.'
- *Capital—ownership or leasing or contractor.* 'One of the problems with the smaller vineyards is they've got too much money tied up in capital. Like wheat cockies: until about 10 years ago, every cocky had a header, pulled it out every year, whereas now they realise there is no point having a little one going for months. Might as well have a contractor out for 10 days and have it all in and done. I think that is one of the bigger issues, just getting the right amount of capital.'

The water intensity of grapes is relatively low in comparison with other horticultural crops such as almonds. Almonds need 12–13 megalitres a hectare, whereas vines irrigated with current drip-irrigation technology are now needing 6.5 megalitres a hectare. To put this in perspective, block allocations were historically just above 9 megalitres a hectare.

It is difficult to be certain how much of the growth in the wine industry—and growth in the prosperity of cities such as Mildura—is the result of commodity price booms and how much is the result of water trading:

*I don't think the water trade has made any difference to growth at all. You're talking about the town? The town and number of people? No, nothing at all. What the growth is about is, I suppose, the success of the table*



*grapes and the wine grapes, a lot of it. So water trade has had bugger-all influence on table grapes and total area of wine grapes.*

*I reckon it would be about half. A lot of completely new vineyards sprang up as a result of trade; the other half was probably the redevelopment from dried fruits.*

Wine packaging is unaffected by the location of wine production (but is affected by the volume of throughput): 'If water shifted up or down stream from us the product would probably still come here ... This is a good point for central distribution for Sydney, Adelaide, Melbourne ... Once the wine is on a truck it's pretty academic how far you take it ... It's the unloading and loading where all the expense is'.

### Table grapes

After a few tough years the table grape industry is looking buoyant. Many of the people interviewed felt that a seismic shift might be imminent. Many also felt that smaller vigneron would start to think seriously again about table grapes:

*I think we might be seeing a swap between table grapes and dried fruit in the small-block areas. Table grapes have high labour demand and resist mechanisation. Once they were mechanised dried fruits become much less labour intense. An increasing proportion of the (albeit decreasing) tonnage of dried fruits is coming from greenfield sites.*

*I think table grapes still offers a really great opportunity to expand, and it suits the smaller-type properties. It's very much a return on labour and certainly a bit with your capital as well and can generate some serious money. Forgetting about the issues of allocation of water and the state of the storage and that sort of stuff, I'm more long-term optimistic about it ... [grower] is a good operator: he's at the top end of the market, [he's] got two properties, about 50 acres of table grapes, and that's pretty full on if you are doing a lot of the culture yourself. And that's what they try to do, and they do that because they want to maximise the quality.*

Table grape labour demands are spread over a longer period than is the case with dried fruit. The requisite skill levels are also higher:

*Harvest will start pre-Christmas, and table grape growers can go to March. So there is quite a long harvest and packing period. Picking table grapes requires particularly high skill: you want people you can trust to make the right decisions—that sort of higher skill rather than just picking bunches of dried fruit. And I think there is a move out of the packing shed back into field packing, just to keep your costs down. Asian people are very good with their hands; they are excellent at pruning and grafting, etc. If you talk to the growers who use them, they say they are very, very good. And they work! You can't expect an Australian worker to do that quality work generally.*

### Citrus

The traditional processing citrus industry (Valencia) was largely dependent on tariff protection. In the absence of protection, the Australian industry struggles to compete with countries such as Brazil on the Australian market:

*The Whitlam Government had a 25 per cent drop in tariffs across the board, then in the Keating Government's term they dropped protection for citrus down to 5 per cent, whereas the motor vehicle industry is still enjoying 15 per cent. Major competitors like Brazil, which still has a 35 per cent tariff protecting their citrus industry, are sending not only frozen or concentrated orange juice over to Australia now but also frozen fresh orange juice.*

The competitiveness of the fresh citrus industry (mainly navels) depends on changing prices, variations in grades and the prevailing exchange rate:

*Citrus is different: probably halved in dollars per tonne. I'm talking the crop picked in '04 and the crop picked in '05, if we take one property, was up around 800 000 dropped to 550 000 and probably back to 670 000 this year. But back in '02 I think it was a million, so it's up and down with the grades and the Australian dollar was the main thing.*



## Other crops

Small areas of summer crops, winter crops and pasture are irrigated in Sunraysia. There is also a sizeable vegetable industry, including asparagus. One family outside Robinvale grows most of the carrots sold in Australian supermarkets. They grow them on greenfield sites that were brought into production after the advent of water trading.

## Managed investment schemes

Managed investment scheme developments are greenfield, rather than closer (soldier settlement) blocks. Increasingly, the community is concerned that this clean start can give the schemes a competitive advantage over family farmers in the region:

*You can't put under-vine sprinklers on old trellises that are too wide, the plantings were all wrong, and there is no point putting a Rolls Royce irrigation system on clapped-out old plantings. Also, they manage their own water infrastructure rather than draw water from the water authority's system. The difference is in the pump district; the water costs are higher because the growers have to contribute to the infrastructure and the pumping charges. But the cost for private diverters out of the river system is a heck of a lot less. It also lowers transaction costs for entry to the area. It's too hard for them [MISs] to try and buy up 10 small farms when they can go up the river and buy one big one.*

## Managed investment schemes and tax

Many irrigators are concerned that the tax treatment of managed investment schemes gives them an unfair advantage over other farmers:

*In terms of the MISs, of the management investments that put in large volumes of horticulture, there is an argument that they are tax driven, and that holds some weight in that people do invest. They will get to the end of the year*

*and they might, say, you have a \$30 000 tax bill to the Australian Taxation Office but if you invest in almonds and put \$30 000 into almonds that is tax deductible so you reduce your taxable income, so basically they only risk half. Say their profit was \$60 000 and say it was 50 cents, then their tax bill would be \$30 000. If they invest \$30 000 in almonds that brings their profit down to \$30 000, [they] only pay \$15 000 tax. It could be 30 cents if they're a company structure or somewhere in between, so they are only risking this amount. So that is why people say they wouldn't do it unless that was involved, but that is available to anyone, not just MISs. You can go out and do it on your own bat. But where, I think, is when these MISs come out, it might be agri-horticulture, and they'll come out and say well there's 11 per cent, based on these price assumptions and expenditure assumptions for the next 15 years. They do an internal rate of return calculation and will come out with an 11 per cent return, which means, just on the cash flow and costs of monies, and the value of monies incorporated in that. Now if you're only, if an almond or whatever—mangoes or grapes or dried fruit—comes out at 11 per cent, given all the risks in horticulture in terms of market, the Australian dollar, labour, whatever, to me that is not high enough. You're just doing it for tax reasons. If you're investing in agriculture or horticulture it should be 15–18 per cent or something like that. How do you police that and say, 'Well, no, we are not allowing that through, we are not giving that a product ruling'? Even if things work out pretty well it's only 11 per cent, so it's tax driven. People are only investing in it for tax reasons or they are not getting sound advice. So the levels don't really get to that stage? Well, it could. But how you police that, because all they will do is up the price assumptions or yield assumptions and get it up to 15 per cent.*

*I have no difficulty, I can compete with ... a 10 000-acre corporate farm whatever it is. In fact it's all an aggregate of units: so many hectares per tractor per person ... their unit size for a fully developed property with no young*

vines, just in maintenance, spraying and irrigating and fixing the odd broken post, is 120 acres per person ... Now when it's actually all broken down ... my farm is one of those units. One of the philosophies I've been looking at is to attain one of those units. If we can stay at one of those units or thereabouts traditional farming will stay in business. And we'll do it easy because these guys here have a serious level of inefficiencies built in simply because of their sheer scale ... The McDonalds run: hot days they get out and do what they have to do in the morning ... [then] 'Oh, we got to go to Mildura to get a fan belt'. So they fill in a requisition order, drive to Mildura in an air-conditioned car, round up the fan belt, call round at McDonalds to get some food on the way back, and clock off at 5 o'clock and go home. Over here recently they sent some bloke out on the tractor to go do some spraying. Didn't come back for smoko or lunch, so they sent a search party out. They found him way out the back; got bogged at 9.00 am and waited all day for somebody to go and get him ... [I can compete with them at the farm level but] there's a limit to how much capital you can get hold of under this arrangement. If [I] could get money under [their] sort of arrangement then look out. If I could borrow, if the banks were deemed to be treated the same as these guys, and that's my answer to this situation: treat the bank as the third party person the same as the career investor. And then we have a level playing field. I'm satisfied if it's a level playing field. Either sever it or give us the same rules.

### *Managed investment schemes and the shape of the water market*

Managed investment schemes are large enough to have considerable influence on the shape of the water market:

*There are 7500 hectares of almonds and 900 hectares of olives, and half of them would be less than three years old. It's just amazing. So there is a lot of water that is actually allocated that isn't actually being used there yet. My*

*understanding is that a few years ago there were some people—there was a bit of leasing of water going on while there have been occasions to establish development. They're changed now. I think now they are in the situation to purchase the water, buy it all up front, and then put it back on the temporary transfer market.*

*For the last three years I've had an arrangement with some of the almond growers in Melbourne. It's like a contract: we agreed on a price and that price stood for three years, which over that time has actually doubled what the water was going for, so we actually have done alright out of it. Now the almond industry has switched around; now they're actually buying it all up front at a lower price and trading it back themselves now. I'm not actually sure what they are doing. Our agreement ran out last year and so I haven't heard from them.*

*Lately the MISs have been buying water mostly out of the Goulburn system. This probably hedges their risks with regard to water allocations over the long term, but I also suspect it has enabled them to get into the queue for back trade up the Goulburn and to move water into an area where they can claim Murray allocations in advance of the unbundling and source-tagging that will take place in July 2007.*

### *Community reactions to managed investment schemes*

Overwhelmingly, the irrigators interviewed expressed negative views about managed investment schemes:

*For corporate farming to grow, it has to get water from traditional irrigators. This benefits only the corporate investors, and destroys family farms.*

*Managed investment schemes should be scrapped from irrigated agriculture. The quickest way would be to ban permanent water trade out of irrigation districts.*

*Do you think we really need all those almonds? See, it is all these doctors, lawyers and all these people that are getting in there because the government is giving them all this huge, huge tax benefits on all these properties. They are just destroying it because at the end of the day if something happens—I'll put it to you in rural Australian—if the shit hits the fan they will still be practising and doing their duties over there like doctoring and lawyering; they will still be working. But the true farmer who relies on that will just die. And that's where they are bringing us, they are bringing us all down to our knees.*

*They move on to the new crop. They're already gutted this industry. Gutted like almonds, so they move on to another industry. They have total flexibility because of this capital-based resource at very much subsidised rates by the Australian taxpayer and the Australian Government to move at will from industry to industry and leave skeletons behind for whatever segment of the community has actually been operating for generations in that horticulture enterprise—be it grapes, almonds, oranges, table grapes, asparagus, whatever.*

*They still don't understand why these guys have got water. They don't really understand how water trade works and what the rules are, and there are a lot of people who are anxious about MISs at the moment. And the wine industry is quite depressed; the dried fruit industry is always depressed. And a lot of it's anger and misunderstanding.*

*There are a few issues; there is some terrible emotion running about those MISs. I don't see how they are going to impact on table grapes, I just can't see it. They couldn't get the acres in the ground to have an impact, they couldn't get the volume. And if they were going to do it for the export thing they are going to be competing overseas, against Chileans and South Africans. So they are not going to be taking market away from existing growers in the domestic market; most of it's geared for export. And I think they'll get a hell of a fright when they*

*start ... they've got labour for almonds and olives, but when they get into the table grapes, boy oh boy. And it's just to get the sheer volume of people to do it. I just couldn't imagine the logistics of getting 400 or 500 acres of table grapes and then having to get things in, which would require hundreds and hundreds of people. I just don't know how you can; just setting up the toilet facilities would be like a bloody major show event. And they've looked to dried fruits, and there are some schemes but not so much MISs as such, but they'll only do that if the returns are good. And I don't know why anybody would get into horticulture just for the taxation breaks—a one-off thing; they might as well donate it to charity.*

## Water trading into the future

### *The effect of current trading activity*

Participants observed that permanent trade into Sunraysia aims to secure the full future water demand for new crop plantings. The observed trade in temporary water in the other direction involves the sale of water that is not required during tree and vine maturation. This has implications for future trends in patterns of water movement. For example, the temporary trade, which currently acts to offset the reduction in water availability in regions selling water entitlements, could dry up.

### *Effects of future investment and industry growth*

SKM (2006) expects further volumes of water to move into Sunraysia:

*Trade of water is occurring from the Torrumbarry and Goulburn systems to new and expanding irrigation developments in Sunraysia. Up to the start of 2004–05, 65 GL of water had been permanently traded into these developments in Victorian Sunraysia. An additional 90 GL of development is expected over the next five years. It is therefore possible that over the next five to fifteen*

*years, there will be between 150 and 300 GL of water permanently traded into Victorian Sunraysia from upstream areas.*

Recent changes to taxation arrangements for non-forestry managed investment scheme developments have created some uncertainty about future trading patterns.

## Irrigators' views

### Perceived benefits of water trading

Irrigators in Sunraysia see benefits of water trading in a number of areas—business growth, capital productivity, opportunistic cropping, liquidity, and cash flow and debt management.

#### Business growth

Irrigators said private diverters have been able to increase the size of their businesses by buying more water:

*Water trade has probably been an integral part of it because it has allowed me, for example, and others, to expand their holdings of water. I've been buying for 10-odd years to keep growing the enterprise but at a much slower rate. The single biggest driver is the farm-gate price; and your return on your investment. Water would probably be the second-biggest driver. There is a bit of chicken and egg in this respect. You have got to get the water first and that is what I've actually done—gone out and secured the water. The minute you've got water you now have a visible asset and you've got equity; you've got the visible water and you've got the land, then the next biggest thing is funding issues. So your return on your investment, farm-gate price, your water, your funding and then your infrastructure are probably the ... main ... keys.*

Until recently district irrigators had expanded their business by buying neighbouring properties complete with water; they have not had to enter the water market as such. But this is

changing. Increasingly, they are faced with the prospect of buying a property that has been stripped of its water and then having to buy the water separately.

### Capital productivity

Water trading allows farmers to make conscious decisions about how much capital they invest in water. As one project participant put it:

*Yeah, in terms of whether temporary or permanent, but normally, I think, last year we were trading for \$50 a megalitre so historically this year is an exception. I think '02 was an exception, so we might actually change our decisions from now on. But \$50 a megalitre divided by paying \$1400 for it, that's like 3.5 per cent, and if you've got that sitting out at 8 per cent it makes sense, but this year at \$250 a megalitre that's sort of 17 per cent or so ... There is probably one property I look after, they're always probably 70 or 80 megalitres under what we need and that's been a different case ... We've opted to go and actually buy 80 megalitres as capital. Probably should buy because there is a lot of security in there.*

Another irrigator saw it in similar terms:

*If you work it out on a temporary basis we are not paying much more than probably paying 5–6 per cent on the water. So if you borrowed money to buy permanent water it's equivalent to dealing in the temporary market. This year it will hit over 20 per cent, but on average the benefits of temporary trade definitely outweigh the costs. And ... it doesn't tie up capital to do other things: it lets us expand, and that's what we have been doing.*

Yet another irrigator had been looking at things in the same light but, because of the uncertainty surrounding allocations for next year, is now second-guessing a recent decision to sell some water permanently:

*Yes we have sold off. We had 660 megalitres in total and we have sold 100 permanently. I wish I hadn't done that now; it's not worrying me that much but I wish I hadn't*

*sold that much ... It's worrying me in terms of allocations for next year: if you had more you could get more, but between the six lots sold we traded up to 250–300 megalitres a year. I knew how much water we used, but at the time I didn't really think about what was coming up. At the time I sold it no one was really talking about that anyway; it might rain yet anyway. I think I'm getting by on that really low water use without really trying. I'm just using the probes and look at everything, what it looks like. I think I could get by next year with 50 per cent of it.*

### *Opportunistic cropping*

Most horticultural production in Sunraysia is based around permanent planting. Historically, there has not been a great deal of opportunistic cropping. But vegetable production in the region has increased dramatically since the introduction of the water trade. Large vegetable growers are increasingly contracted to produce constant throughput for the supermarket chains. They can, however, also adjust their operations in accordance with movements on the temporary water market:

*Generally, we put in 300–400 acres of melons a year, which we haven't done this year. We haven't put one melon in the ground because we were worried about water restrictions. We anticipated that there was going to be a bit of a problem with temporary water ... We employ between 50 and 60 people for seven months of the year, we have 14 permanents now—that's packing and picking and growing the melons—and basically what it has done is that we are only using our permanent staff. It has knocked off about 45 jobs ... There were two parts to the decision not to plant melons. One was the instability of the markets. We've got a direct deal, we supply Coles and Woolworths direct—straight to the big chains—and it was fine, but it was going to be unstable this year because the vines and that ... the grapes are basically worth nothing. In a nutshell, most people are losing money on their grapes this year. If you have a look at every row that you drive past there's black plastic laid*

*down. I guess it was a financial decision that we would be in competition with every blocky around with the melons, and if the prices drop at all I can guarantee that whatever we pay for the water will be too dear. Yes, OK. It was a two-part decision, not a single-part decision—only for cash crops and you don't blame anybody for doing that. Everyone has to survive.*

Not all of Sunraysia is dedicated to horticultural production. Some growers with grazing enterprises—mostly in the eastern Mallee—have made the decision to base their businesses on temporary trade:

*In temporary water, every year, very active. Permanent water—only once. One big sale ... Well, it meant that we got rid of all of our debt, that we were able to build a new house ... The temporary market has ... it's been cheaper every year except one to buy in temporary water than it was previously to own permanent water. So I've saved money by using the temporary market. Typically, I'm able to buy water in for less than 5 per cent of the capital cost. It's really the timing that is the biggest consideration. Nearly every year it's been dearer in spring and cheaper in the autumn. What we do with it has tended to evolve into where we can use water in the autumn rather than spring ... We lamb our sheep in the spring and we try to finish our lambs in the autumn, so we use some annual pasture for finishing lambs.*

### *Liquidity*

Water can be sold rapidly—with minimal advertising costs and very low transaction costs—virtually anywhere in the southern connected Murray–Darling Basin. There are willing buyers and sellers at all times. It is highly probable that the next trade will be executed at a price equal to the last one. Water is a very liquid asset. As one farm manager sees it:

*Water trade has provided many farmers with a form of superannuation. Yeah, well it allows them to live ... Their investment in land and water is more liquid in that they can sell off part. Generally farmland is not very liquid: you*



*have to sell the whole business or sell nothing, whereas you can sell off a portion of your water relatively easily at the moment. So is that super or is that working capital or is that taking money and investing in something else? I don't know but it allows them to sell part of the operation.*

It is this liquidity that is changing the dynamics of consolidation in the irrigation districts. People leaving farming no longer have to rely on the comparatively thin real estate market to realise the value of their remaining assets. Nor do they have to offload their assets at fire-sale prices.

Of course, some people can only envisage selling their farm as a going concern. That puts them in the thin real estate market, which is best inhabited by those wanting to consolidate their holdings. But it is also an invitation, for people with an eye for a bargain, to buy the property and sell the water separately: 'There is one bloke in Merbein who has been buying up blocks, bulldozing the vines and stripping the water off'.

### Cash flow management

The temporary market offers irrigators the potential to generate extra cash flow:

*Water trade—probably people use that as cash or cash advance. They've sold off permanently their water. I don't know what they are going to do in the future. They've sold it off, high-impact water, because they can get another \$100 000 for the next five years. Temporary water trade was a pleasant thing: if you handled your water well, watched carefully, you could temporary trade off your water at the end of the season when you're virtually finished with it. A nice little earner. But last year, of course, there wasn't any trade. People didn't have the money to buy.*

Very few irrigators in Sunraysia can invest in the market intelligence necessary to optimise their returns from selling on the temporary market:

*You have to be pretty smart to pick the peak in the market. It's not an easy market to read because they have put so many rules in place, and the restrictions on where you can trade. The information is there, but you really got to ... Well, what I've worked out anyway is that the local brokers aren't much good at selling it for you because they don't know what the opportunities are outside the area. My gut feel is buy locally, sell out of town. That's what I've been doing.*

### Debt management

The water market offers irrigators the potential to manage their debt. But people's attitude to risk is generally asymmetric: they are prepared to gamble more recklessly in order to avoid a loss than to achieve a gain:

*Water trade gives farmers flexibility in how they run their farms. I don't know, I wouldn't have thought it would have changed much. A good farmer has always had the ability to put his water on the temporary market; a bad farmer, if he sells his permanent water, won't be able to buy it back, so I don't see that as flexibility. You might argue it has got bad farmers out of the industry.*

The human face of this attrition looms large in most irrigators' minds:

*I've got a mate of mine who I really feel for ... He's had about 250 tonnes of wine grapes, but last year he didn't get one berry in, not one berry. I said, 'What's happened, get any for next year?' 'Nah, I've got nothing', he reckons. He has this water, which he still has to water his vines, so he is going to cut back on the water to see if he can get some money in with his water trading, which at the moment it's not real big money but he's trying to get some money out of that to keep it going. The thing is, he is just going to go down. I can see him going down.*

Behaviour in trading is strongly influenced by debt levels: 'Depends upon the individual level of debt. If they haven't got much debt then just keep your permanent allocation,



but if they have ... a lot of people have been forced to sell off surplus water because of their high debt levels and poor returns’.

### Perceived costs of water trading

Irrigators in Sunraysia see costs of water trading arising in a number of areas—increased competition and market saturation, stranded assets, queuing for timely irrigation, the build-up of pests and diseases, and changing frost risk.

### Increased competition and market saturation

Water trading has allowed for a net increase in irrigated horticultural production. The overwhelming majority of irrigators in Sunraysia are horticulturists. Many see water trading as having increased the competition. This is a big concern for quite a few of them. One irrigator explained:

*I believe that in years to come with the amount of production they have put in, they are going to flood their own markets. I predicted this with the wine grapes 10 years ago. Look where they are now. I predicted 10 years ago that this was going to happen and ... it's happened. And those almond plantations ... and look at the olives. They are all looking at being the big leaders in olives, they are going to make this and do this, but if you keep within supply and demand, then fine. But they are going to create a surplus amount of olive oil and peanuts; they are going to export them and this and that. Rubbish! It's not going to happen.*

It is not just the quantity of extra horticultural products moving into the market that is bothering them: the competitiveness of existing irrigators is being diminished because of the economies of size the new developers are able to take advantage of. Something in the order of 40–50 hectares is the unit of production capable of being managed by one person on new properties. As one irrigator sees it, ‘If you were at a unit size you have no problems. Now the problem with your 20- or 30-acre wine grape grower in Mildura he is only 25 per cent of that unit’.

### Stranded assets

As water moves out of pumped districts, the delivery infrastructure becomes an under-used asset. These ‘stranded assets’ increase annual costs for remaining irrigators: ‘If there’s 20 000 megalitres pumping and it drops back to 15 000, the pumping costs, the overheads and maintenance costs are almost still the same as the 20 000. The only savings are the energy costs to pump, so the water that is left behind becomes more expensive’.

Many irrigators—especially in Merbein and Mildura—are very concerned about the long-term viability of their districts. One Merbein irrigator said:

*I'd hate to see or think we got to a situation where we didn't have enough critical mass as a district to cover the costs—especially increases beyond the CPI—and, even worse, not have the confidence to go ahead with the re-pipe line. That would be game over ... Although a lot has gone out of what is the constituted irrigation district there are quite a few other areas that, if they hadn't got on board, we would have been in big trouble. I did some sums at one stage and I wouldn't have been surprised if they had to put up the water rates to generate the same amount of revenue by 15 per cent over a three-year period, forgetting about what it costs to do it.*

It is not just the effect on annual charges that bothers the remaining irrigators: they resent the loss of visual amenity and the abandonment of neighbourly obligation, and they deplore the loss of hope and the shattering of the sense that they are all in this together:

*There's farmers around here really struggling. And it's happening already now, it's happening right now as we speak. Where farmers are selling their water, keeping their house, and just neglecting their vineyards. See, and if that's happening, it's got to be stopped ... The water on these properties should not be allowed to be sold. And I believe that whoever's got land is entitled to buy water but it shouldn't fall into the hands of people who just wanted to invest. ... See it has happened now over at*

my brother's place. This guy went in, he needed the water—I think that property had about 80–90 megalitres of water—he bought the water off it, took it across to New South Wales ... My brother really had to fight to get all those vines pushed up and burnt because he is getting pests and diseases there. The vines was just left there, so this guy ... well, they put the pressure on him to go in and push it all up, heap it all up and burn it. It's ruined my brother's farm because right next to him is another 30 acres that used to be a fruit block: *paspalum* and grass and weeds, it's all left there ... Well, how would you be if you were living in the city, a bloke comes in there, buys a house, demolishes it, pulls it all apart, takes it all away? You have a beautiful home right beside it, and in there there is broken bottles and rubbish and it's built up in there, rust that high. And you've got a nice beautiful home right beside it; well what does it do to the valuation of your property. My brother's place over there looks a bloody disgrace. He has a beautiful farm there; he has this huge 30 acres there that this bloke took the water off and left it all there.

Another irrigator drew attention to how water trading has made for a psychological difference between this downturn and previous downturns: 'We've had some pretty tough times before, but the whole district, every acre, was productive even during those tough times. At the moment people have sold their water off, so they are not irrigating. They are leaving the snails and the birds and rabbits and weeds; it's a different scenario than we are used to'.

Some irrigators are more sanguine about both the downturn and the water trade and the effects on stranded assets:

*I do see some problems with stranded assets in some of the districts; to a lesser extent in Robinvale because of the strength of table grapes. Basically, whilst there might be a few properties droughted off they won't last long droughted off ... The ability to look after that issue from the authority's point of view is there. It's a pricing mechanism that should be put in place, so it means it's just not easy to run away from having a share of running*

*the infrastructure. Even though you might be sitting there with a house and a big block you are still responsible for maintaining an asset to the boundary. And I think in the long run people that are sitting on that they'll think this is not worth it and they'll sell it. And they'll sell it eventually to someone who will activate that land. It would be a fairly expensive hobby farm, I would have thought. I think it will be self-correcting.*

Others are philosophical, seeing the changes as inevitable. They also see that both parties involved in the direct transaction come out of it better off:

*What we had was a landscape where water was distributed according to best practice of 100 years ago. That's clearly not the best outcome for today's technologies and enterprises, so you have to have some sort of a mechanism to redistribute the water, and all the water trade [is doing] is lining up buyers and sellers to enable that redistribution to happen ... The people involved in the change first hand are generally happy about it. It's the people looking on and seeing their world change around them in ways that they have no influence or control over that feel uneasy about it.*

### *Queuing for timely irrigation*

The Barmah Choke limits the amount of water that can be delivered to irrigators below the Barmah–Millewa Forest within a given period. In the past 20 years its capacity is estimated to have decreased from about 9400 to 8700 megalitres a day. (This appears to have been largely the result of siltation, and the Choke's capacity might be restored by a flood or a series of floods. It is unclear whether capacity is changing in the longer term (SKM 2006).) For this reason water entitlements cannot be traded from above to below the Choke. Trade from other parts of the system is ostensibly better, but this is not without its subtleties:

*Most of the initial trade into Sunraysia came from the Torrumbarry system, which is on the Murray below the choke. Even so, historically, demand in Torrumbarry*

peaked in spring and autumn. Sunraysia demand peaks in the summer, so what we are seeing now is a further concentration in demand and further stress on the Choke. But counterbalancing this is the more recent trend for water to be traded out of the Goulburn system into Sunraysia. In theory, we can draw on this strategically to use water from the Goulburn during times of peak demand, thereby taking pressure off the Choke.

SKM reported:

*During the period between mid-December and April of each year, efforts are made to regulate flows at Tocumwal to not exceed 10 400 ML/d, which allows for the Choke capacity to not be exceeded after supplying the Edward and Gulpa offtakes that are downstream of Tocumwal ... Most of the release requirements for the Murray Mouth can be met by making additional releases from Lake Victoria and the Menindee Lakes. This water therefore does not have to be passed through the Barmah Choke during the periods of peak summer demand but it can be transferred into Lake Victoria during spring or periods of lower demand over summer. (2006, p. 1)*

To some extent, conditions on diversion licences, governing the maximum instantaneous extraction rate for each pump, do help to ration the shares of total extraction open to diverters and the pumped districts. There are also some underlying behavioural patterns that have been used to avoid problems: 'Most of the irrigators in the pumped districts irrigate on the weekend to take advantage of cheap electricity tariffs. We have narrowly avoided having to ration on a couple of occasions by asking some of the very biggest diverters to skew their irrigation towards the weekdays to give us more of a 24/7 use of the river's capacity'.

Irrigators in the pumped districts are acutely aware that they might be disadvantaged by the new developments:

*Water trading has actually eroded [our rights]. In recent years we've got more people drawing water off, which affects the migration of water down below, between here*

*and Swan Hill. So there is more demand on that channel capacity of the Murray. And what that ultimately means is that we'll be hit hardest when the existing high-security water which we use here is actually going to be reduced in security because we have more people drawing on that channel capacity ... We always have an obligation to send water through to South Australia as well. So with this migration of water downstream it's actually put more pressure on the channel capacity of the Murray River.*

Of great concern to irrigators in the Sunraysia pumped irrigation districts, who are all downstream of the almond developments, is the Murray's ability to supply the water required when it is required. Water traded in might not have been in use—so-called sleeper licence water—and will add to the volume that has to be transported downstream. It might have had a different regime of use; that is, water used for pasture might be used over six months, whereas for almonds and vines it would be used over four months, increasing the peak river flow. Water traded to the Sunraysia region would generally come from upstream and therefore have to travel a greater distance to its destination, increasing transport losses:

*But if you are going to bring that water from everywhere else down to here, the river's not going to cope. When they fire these pumps up, when you take October–January, when the really warm days get going, there is going to be a hell of a lot of water dragged out of the river, and its not designed for that.*

*The short-term ability of the river to conduct water is limited. So what we find is, to counter that, a lot of these large developments are putting in 500-megalitre dams as buffer storage, but small growers can't do that because their land is fully vined, so they go on water restrictions in those peak consumption times.*

*The [First Mildura Irrigation Trust] sees this as a hugely important issue. The trust has invested a lot of resources into building an off-stream storage to help make sure that FMIT irrigators have reserves available to them in the event that rationing is introduced.*

*The FMIT has certainly spent a lot of money, but whether or not it is going to help is open to debate. The proof of the pudding will be in the eating, I suppose.*

### *The build-up of pests and diseases*

Unmanaged orchards and vineyards have a higher incidence of pests and diseases. This increases the inoculum potential for neighbouring properties.

### *Changing frost risk*

Tall grasses and weeds growing in an unmanaged vineyard act as a dam to the movement of cold air. If the vineyard is in the lowest part of the landscape, this can in effect transfer the risk of frost to the next-lowest vineyard.

### *Cognitive dissonance in the irrigation community*

Cognitive dissonance is the uncomfortable tension that comes from holding two conflicting thoughts at the same time.

The theory of cognitive dissonance sees those contradictory thoughts serving as a driving force that compels the mind to acquire or invent new thoughts or beliefs or to modify existing beliefs, so as to reduce the amount of dissonance (conflict) between attitudes, emotions, beliefs or behaviours. In the extreme, people's mental health can depend on their being able to reduce the conflict between those different thoughts.

Irrigators are reconciled to the continuing amalgamation of properties. They know this means fewer farmers and thus fewer people in the area and fewer children in some of the local schools. Accordingly, irrigation communities rail against what they see to be the underlying reasons for people feeling they need to sell, but at the same time they have much sympathy for community members who can no longer continue in farming. There but for Fortune go we.

Property amalgamation is a familiar, if somewhat discomfiting, part of the farming scene. The exit is mourned, and the purchase is made as dignified as possible.

The change is understood to be an opportunity for neighbours as much as a loss for the community. No one can begrudge the purchaser their gain. Rather, there is almost a sense of noble obligation surrounding the purchase: someone must keep up the good fight.

Separating the sale of land and water changes this dynamic. It opens the possibility that the vendor will, in effect, cause irrigation to cease on that property. This, in turn, will bring about a net reduction in irrigation in the local area.

The manifestation of these difficulties in Sunraysia is to a large extent masked by the growth of the major towns and by the contrasting fortunes of some of the satellite towns. Merbein, for example, appears to be in decline relative to Red Cliffs and Irymple.

## *Community views in Mildura*

The city of Mildura is on the Murray River, 550 kilometres north-west of Melbourne and 400 kilometres north-east of Adelaide. The Shire of the Rural City of Mildura covers 22 214 square kilometres and incorporates two statistical local areas—Mildura Part A, including the City of Mildura and a small surrounding irrigation district, and Mildura Part B, comprising the surrounding hinterland of both irrigated and dryland agriculture. This case study focused on Mildura Part A. Interviews were conducted with irrigators and residents of Mildura City and other townships in the region, such as Red Cliffs, Merbein and Irymple.

Mildura is one of Australia's 10 fastest-growing regional cities. The estimated resident population of the Rural City of Mildura at June 2004 was 51 263, representing an average annual growth rate of 1.32 per cent between 2001 and 2004 (SMEDB 2006).

## Economic profile

The local economy is dominated by irrigation-based industries that produce wine grapes, table grapes, citrus, dried fruits, nuts, avocados, olives and vegetables, generating a net farm-gate value in excess of A\$1 billion. There is also broadacre dryland cereal, lamb and wool production.

Other important industry sectors in the region are retail, manufacturing (especially food processing), mineral sands mining, professional services, and tourism. Among recent developments are a \$70 million marina on the Murray River and the world's first solar power station. The district also services the extended wine regions of the Barossa, Clare and Griffith. Water is the limiting factor in the development of new land for horticultural use, but the introduction of water trading has provided opportunities to increase the area of land under horticulture (Thompson 2005; SMEDB 2006).

The agricultural industries are supported by a network of infrastructure and expertise:

- technical advice and extension officers from government agencies
- research institutions—including CSIRO
- packing sheds and packaging facilities
- fruit processing operations
- storage facilities—including cool stores
- air, rail and road transport providers
- a substantial agricultural labour force and an employment services network specialising in seasonal labour (SMEDB 2006).

The strong agricultural and business services sector provides:

- chemicals and other farm supplies
- machinery and equipment
- pumps and spraying equipment

- accounting, legal and marketing services
- several industry associations and peak bodies—for example, in dried fruits, citrus, and wine and table grapes
- contract farm services (SMEDB 2006).

## Community services

Being a large community, Mildura is well served by hospitals, an airport, schools, banks, supermarkets, cinemas, doctors, lawyers, accountants, and sporting and recreational facilities. There is a base hospital and a private hospital, a community health service, 17 medical clinics and seven residential aged care facilities. There are 46 schools and several adult education providers, including a campus of La Trobe University, the Monash University Mildura Regional Clinical School, and the Sunraysia Institute of TAFE.

## Community profile

Figure A.4 summarises the community profile of the Mildura Part A Statistical Local Area.

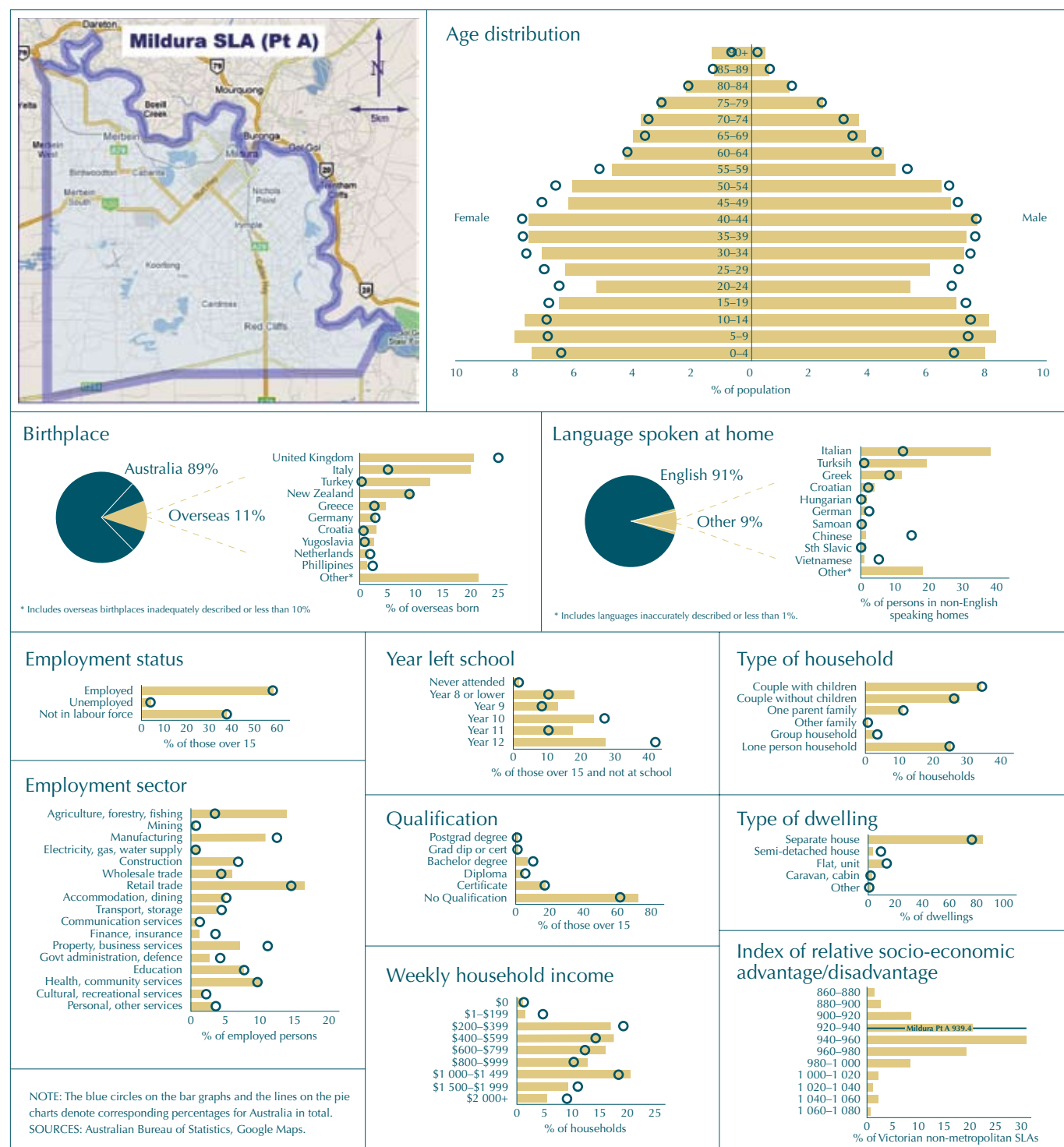
## Community strengths

Participants identified the greatest strengths of their community as the climate, the environment (with the city's location on the river) and, until recently, the abundance of water. Also noted was the diversity of the people in the community—including the early Greek and Italian settlers and the more recent influx of people from Iraq, Iran, Turkey and elsewhere in the Middle East.

Several participants talked about the 'critical mass' in Mildura, which was sustaining the economy and population growth. Although most of the Mildura residents interviewed noted the city's growth, few could pinpoint the cause. A local government official explained that this was because there were multiple and compounding reasons for growth:



Figure A.4 Mildura Part A Statistical Local Area: community profile





What you are seeing here is a regional city of 60 000 people that serves a broader community of 100 000–110 000 people. We've had people from Broken Hill, Swan Hill, the Riverland coming here to access retail, sporting and recreational facilities. So it's generating its own growth. This is traditionally a very healthy agricultural sector, with horticulture based on the most efficient irrigation processes, getting good returns for water in a general year, which is increasing the area under horticulture development. That is bringing with it housing and transport industries to move products to market. So, in addition to that, schools, police, medical, all of those associated industries, plus the building industries, are coming. It's really a dynamic place to be at present and that's with three years of drought and a downturn in the horticulture industry for the last 12 or 18 months. It's a very resilient economy.

Because it is an isolated and remote community it has a strength of character of its own. It doesn't rely on a lot of external factors, but sometimes that can be seen as a disadvantage. It might at times be seen as being too insular, but the willingness to get on with the job and get things done means it really is a very big 'can do' community.

### Community spirit

Although Mildura is a large and diverse community, it is not necessarily cohesive. Participants were asked to rate the sense of community on a scale of one to five, where one was weak and five was very strong. On average, participants rated the Mildura community at three. Almost 10 per cent of regional Victoria's Indigenous population lives in Mildura (ABS 2001). The labour-intensive nature of horticulture means that a large number of permanent and itinerant workers are necessary. Many of these people are backpackers and seasonal workers from other countries who are drawn to the region for nine months of the year to help growers meet the demands of harvest. Seasonal workers are welcomed since a reliable, efficient workforce is essential for the local economy.

One participant noted:

*We just missed out on a proposal for a pilot program to ensure an ongoing Pacific Island labour force because the labour shortage wasn't critical enough to justify it. I think it will get revised. The idea was for the workers that might be here for three months—if they were going to come back they would be trained to ensure a skilled work resource. [With] the Asian people ... the whole family group moves in and the kids pick at the lower level and mum and dad higher up. Their community involvement in sport is probably a bit less because a lot of them are out working on the weekends.*

### Community problems

The primary challenges for Mildura are the simultaneous downturn in all of the four main horticultural industries—wine grapes, table grapes, citrus and dried fruit—and the drought, which is affecting the local economy.

One participant commented:

*Water was never an issue like it is now. If the wine was going down the gurgler, the citrus was doing well. So all of a sudden you have all four elements plus the drought. But with the floods people have been very resilient and they have survived. And I don't see why they wouldn't survive this one either.*

At the time of the interviews, a proposal to construct a facility for long-term toxic waste containment at Nowingi, near Mildura, was referred to by several participants as posing a major economic, social and health risk to the district. One participant concluded, 'Mildura faces a whole cascade of things: you've got removal of trade barriers into Australia, you have water availability, hostile government action building a toxic waste dump in our backyard, and they all impact on the welfare of this community in various ways'. In January 2007 an independent panel commissioned by the Victorian Government recommended against the proposed site.

## The impacts of water trading on the farming community

The Mildura district has enjoyed several years of economic growth and prosperity while at the same time being a big importer of water. As a consequence, the region is one of the prime food producing areas of Australia. Water trading has facilitated irrigation development there. It is estimated that capital investment in irrigated agriculture in the Mildura and Riverland regions increased by \$466 million between 1997 and 2001. In addition, there was a \$301 million capital investment in food processing. Water trade has increased significantly in recent years, with sales of permanent water approximating half a billion dollars (SMEDB 2006). How this has affected the local business community and the lives of the people who live in the region was canvassed in interviews with a wide range of residents. The relatively recent downturn of the four main horticultural industries and the consequences for the local economy were participants' primary concerns. Following is a summary of their responses.

A local government representative reported that the council's primary concern was the current downturn in the horticultural industries. A study the council commissioned to determine the impact of this downturn found that the operations that will survive the downturn will be properties of 15 hectares or less (74 per cent of the businesses and 23 per cent of the area) because most operators have access to off-farm income and those of 50 hectares or more (6 per cent of the businesses and 52 per cent of the area) because they have economies of scale and access to capital. It was thought that farms of 15 to 50 hectares (20 per cent of the businesses and 24 per cent of the area) will experience difficulty because there is less access to off-farm income and there are fewer efficiencies of scale.

Concerns about the increasing amount of water being sold from the district, particularly in the pumped districts, led the council to investigate the possibility of a water bank to ensure that a reliable storage of water remains in the region for

local irrigators. The bank would purchase water to enable irrigators to lease it as required. The local government representative explained:

*There is water trading in and out of the municipality but I suspect that there is more water trading out at this stage because there is a downturn in the horticulture industry. I suspect once that changes around we will be trading water back in because of what is established here. There is a lot less water going out of this municipality than some other places. In fact, up until this year we have been water positive in trading. We looked at whether or not council could set up a water bank but it proved difficult to determine what the reasons were for farmers putting water on the market. It would be very hard to distinguish purchasing water from this property as opposed to that property based on financial circumstances. We never went ahead with it, but we know it was going to cost about \$1.4 million a year.*

A focus group of six representatives of the First Mildura Irrigation Trust expressed concern about commodity prices for the four main crops produced in Sunraysia being at an all-time low. They argued that commodity prices influence where water is used, and the market has allowed water to move from lower value crops such as pasture to wine grapes. This has resulted in a boom-and-bust cycle in the wine industry. Furthermore, the economic downturn in the pumped irrigation districts has resulted in water being permanently traded out, reducing the rate base for authorities to recoup their operating costs. One representative said, 'There is an assumption that people are purchasing rather than selling. No pump district has gained water. If neighbours either side desert their farm, your value falls. If the amount of water going out of the districts is not addressed, they will collapse'.

Many irrigators in these pump districts are taking the option of selling off their water and abandoning their properties. There were concerns that, if more customers leave, the irrigation system will collapse and this will increase costs to remaining irrigators and result in social dislocation:

*It's hard to knock back \$1.5 million for a block. Ninety-five per cent of the water sold is coming from traditional family farms. If people leave a district you need to weigh the benefits of what these big corporation farms bring. If a family leaves, the towns decline. Water trade has the ability to speed up this process. But why increase trade especially in drought? Why invest \$2 billion in upgrading irrigation infrastructure and then let people leave? Family farms in horticulture and dairy create employment in towns. Corporate farms are machinery intensive, which means less value-adding for the local community and less employment. There are less people for the football club.*

*Family farmers spend money in the district; corporate farms extract money. They bring in seasonal workers from overseas, and their money doesn't stay in this country. Foreign workers live in caravan parks, and this does not create community. The backpackers are a bit better. Their major objective is to travel. It is only in the last week that they save money to get to the next town.*

Another irrigator saw the water trade as a form of social engineering: 'Most of the water comes from pump districts where there are mostly soldier settler blocks and is transferred out to new areas. Was it done deliberately, was it planned as such?'

The focus group members agreed, however, that the Timbercorp olive project in Boort had benefited that area. It had brought water back into the district, and there have been opportunities for employment. The need to ensure that water does not leave their region had led this group to consider inviting Timbercorp to Mildura: 'It makes sense to move corporations to where water comes from. People will adjust if water stays here. If water is taken away, much of the land here is poor and it's hard to grow much else. Water is the asset'.

A local agronomist outlined some of the impacts of water trading on the farm families with whom he interacts. He said the greatest social impact has been a consequence of the

decline in the dried fruit industry. There has been a significant drop in farm income and equity. Those most affected are older farmers who changed from dried fruit to wine grapes and then faced the loss of contracts with the decline in markets. Water trading has allowed many of these farmers to sell their water to meet their debts and leave farming by retiring on their property, in town or out of the district. He explained:

*People have not harvested their wine grapes. They have basically left them on the vines. There's a lot of vineyards that have been abandoned this year, and the water has been sold. And once the water goes it will be difficult to bring back.*

*I think the blokes that are really hurting are the older dried fruit growers who got out of dried fruit, got involved in grapes, learned more about the irrigation system and the wine industry, specific pest and diseases, and now have an up-and-going winery but are struggling to find somewhere for their grapes.*

*When things were good, 20 hectares would have been quite a good living. The value of the wine grape crop in the district has come from \$200 and something million to \$130 in the last three years. It's been a really significant fall in income. The price of vineyards has gone from \$45–50 000 a hectare to \$25–30 000 with the water; and the water's worth \$15 000 of that. That's a third of their equity.*

He maintained that many of the problems faced by smaller producers were caused by inefficiencies of scale and adherence to traditional ways of farming that were no longer relevant:

*The problem is that some of these smaller guys have gone in piecemeal, and they have 3 acres of this and 5 acres of this. You need a bit more critical mass to be able to diversify. But if you don't and one variety goes down you have nowhere to go. Often the smaller vineyards have too much money tied up in capital. The average farmer*

would have \$200 000 worth of plant, a tractor or two, a sprayer, whereas I can use a contractor to do most of mine for less than the cost of leasing it. And that's what a lot of people don't get. I think that is one of the big issues—just getting the right amount of capital. The real challenge is to facilitate the property aggregation because people are growing almonds on 20-acre blocks but you need 1000 acres to pay for all the gear.

He outlined several social impacts of farmers selling water:

*I get extension enquiries about the bloke next door not spraying his block. Because some people have sold the water and given up, there is a real disease risk. If people have been there for 30 or 40 years growing grapes and don't have enough money to get out and retire in town. The house on the block is where you are going to end up. A generation ago your vineyard was your superannuation and you sold that and bought a house in town and put the spare \$50 000 in the bank and went on the pension. But that's not there any more for these people.*

When asked how he saw the future for the area, he responded, 'Well, if nothing changes some blocks will be well run—best practice or close to best practice in grapes surrounded by barren wastelands. So something has got to change'.

Other participants discussed the compounding factor of drought and water trading. One resident maintained that horticulture would undergo the same restructuring as has occurred in dryland agriculture:

*In pastoral and dryland farming, they are probably better geared to drought. The pastoral country, they've been in droughts for yonks and there has been rationalisation of properties. The same with dryland farming in the Mallee: properties have got bigger. All these industries have been adjusting for years; it's not a new thing. This is a more of a water drought we are having in the Mildura area. Drought impacts on water availability.*

*Is it drought or water trade? I think it's a compound thing. Certainly the water issue could be the straw that breaks the camel's back, I suppose with a lot of people. Especially this reduction in allocations that is so late in the season. People have already traded their surplus water and it's got them into real trouble. Whether they are allowed to draw on next year's entitlements, like you can in New South Wales just to finish their crops off, I think that would be a great help. That is probably my message: carryover is very important for secure water. It could get worse for a lot of them next year.*

To gain an understanding of the way the finance sector viewed the impacts of the water trade, the authors interviewed regional agribusiness advisers of a large bank and a smaller credit union, as well as financial advisers. One of the bankers was concerned about the number of farmers who have been forced to sell their water entitlements or their contracts. Water trading has increased the value of water and offered farmers a way of alleviating short-term problems with debt, but there will be long-term consequences for farmers and for the local economy:

*A lot of people have been forced to sell off surplus water because of their high debt levels and poor returns. The advantages of selling are that you get the money in straight away and pay off your debt. The disadvantage is that if further on, you don't have that 100 per cent allocation then all of a sudden the farm becomes unviable. I've had a lot of people come and say, 'Well, do we sell off and permanently transfer out water?' I've just run through the benefits and disadvantages and at the end of the day they decided to keep it. It's not something I encourage. It's heading for disaster, because you can have allocated a million megas, but if the creek is dry you can't get it. It's mainly those in dried fruits or wineries who are considering their options.*

When asked whether the bank had changed its approach in managing the situation, he replied:

*We are monitoring it. It's hard when you come to make a credit decision if someone is not contracted. You can grow the best fruit in the world, but who is going to take it? Some people are actually selling their contracts, which is fraught with danger.*

*We get a valuer to do the evaluations and then we actually only extend the value by 50 per cent to provide a buffer. If somebody wants to permanently transfer the water later we go and get a new evaluation straight away. Then we can say, 'Yes, you can do that but the property is now worth so much and you need to reduce your debt by this amount'. We are fairly fortunate that the water goes with the title at the moment as we get notified straight away. They need our consent to transfer the water because we have a mortgage over the property. If someone is in trouble we send them to Centrelink to see what benefits they can get. We want to make sure the grower remains viable. The last thing we want to do is go and hang up the mortgage signs. That's no good for anybody.*

Local financial advisers reported they were extremely busy with the downturn in the industry. One said:

*The service here has been operating since 1984 continuously. It started as a result in a downturn in the dried fruit industry and the downturn hasn't turned around. It's just dried up really. A client of mine was here the other day and he equated it to when you skip a stone across the pond it makes a few ups but eventually sinks. The industry has gone from some 90 000 tonne of dried sultanas to goodness knows what they'll get this year, it might be 25 000 and next year it will decline further because of the removal of plantings.*

He noted that local farmers were experiencing considerable angst because they confront many unknowns in relation to commodity prices, future water allocations, and the rules and regulations of the water market:

*Most of our clients are exhibiting greater uncertainty than ever before. A couple of years ago they took a knock with poor commodity prices, and people were saying, 'It will*

*come round, it will come round'. They are now thinking of solutions, and some of it is long-term structural stuff. They are happy to have their wine contract cancelled to provide options for change. The lack of corporate trust is a big issue. They are saying, 'I've got uncertainty about water next year and uncertainty about this thing called water trade because the government is going to take away my rights to water. We've got to get a site licence and it's not too remote to think that one day the [catchment management authority] will say we can't really give licences to flood irrigators. It's not sustainable'. So everything's changed.*

The reduced water allocations for farmers over the border have heightened this anxiety:

*Our New South Wales irrigators have just had their allocation reduced by 20 per cent. Those growers at the beginning of the year worked out how much water they needed and then the government turned around with this decision to drop the allocation by 20 per cent. Now they have to then go out and buy water that is not attainable. So probably a lot of them will have to make a decision on what part of their property they are going to have to let go.*

Another project participant also raised the problem of uncertainty:

*We are talking about drought all the time, yet the government is still giving huge licences for estates to put in thousands of acres of grapes or whatever. So there is no trust in the government and how it's managing the water. A lot of people round here are just everyday blockies; they are not rich people. In a good year they make a comfortable living; in a bad year they can survive. So when they get their water allocation taken away, or are only given so much, that's reduced what they have budgeted themselves to survive. Alright, they can understand there is a drought and everyone has to do their bit, they just don't trust how the government manages the water. And that's a huge issue. They say, 'Well they are going to take the water because they need the water.'*



*That's fine, but why don't they buy it back off us like we had to buy it in the first place'. And they don't know if next year, if there is water around, if they will get their 100 per cent again.*

## Perceptions of water trading

### *The benefits*

Participants were asked about the benefits of temporary and permanent trading. Most were accepting of temporary trading. One said, 'It's good both farming wise and commercially. Flexibility is the key to everything, in farming, in every business'. Another added, 'It allows growers to iron out short-term deficiencies or surpluses'.

Some approved of permanent water trading: 'I think it's a wiser use, or more sustainable use, of our nation's water supply, which is finite'. A business manager reported, 'For a start, it gives us work but it allows for separation of land from water and allows water to have a value where before it wasn't valued. So there are incentives to use it more wisely or efficiently on site and also for it to go to the most efficient sectors or products'. Another echoed many residents' belief that water should be made available to their region because their region was more productive than other regions: 'There are huge changes in society because it enables the better use of water. You could have a water right on non-arid saline land, or you move that water right to rich land like here'.

### *The costs*

Although the region has benefited from the importation of water from the sale of permanent water entitlements, participants expressed several concerns for communities upstream. They were aware that water was leaving some communities—particularly those with publicly owned infrastructure—with stranded assets. Towns were experiencing a reduction in employment opportunities and economic losses. The following concerns were highlighted.

Although most participants recognised the value of temporary trading, one participant explained that there had been a major adjustment in attitudes to water since the advent of water trading: 'Prior to the water trade, water availability was not an issue, but over the last 10 years the rules have changed—really since 2000. You took it for granted that if you ran out of water you could keep going. No one cared'. Another noted that there can be problems with supply:

*Temporary water trade is fine providing you can get it. There are people out there at the moment who are looking for temporary water. However, your bigger corporate players such as Timbercorp are taking up all the allocation and they are prepared to pay a premium for it. That's a big issue. There are also issues with properties being purchased by businesses in South Australia who permanently transfer the water down there, leaving the properties here to decline.*

Although one of the local business owners was in favour of water trading, he believed that uncertainty in the market caused by the current environmental and political climate stagnates productivity:

*The water trade itself, I'm actually in favour of it. From a theoretical point of view the better utilisation of water is absolutely vital to the wellbeing of Australia. No question about that. And there were water rights that were not properly used, so the actual theory is good. What does concern me is that people are selling water rights to their farms because they are broke and then they are thinking they are going to rent back water and they can't get water. This is a huge problem because even people with secure water rights have had those reduced. And just recently there have been instances where a particular person has sold, say, 10 megalitres of permanent water to someone else and they have paid for that, and then three weeks later the government [of New South Wales] has reduced the amount that will be delivered. Say it was 10 megalitres and then reduced by 20 per cent. So ... the buyer has bought in good faith 10 megalitres, the seller has sold in good faith, but in fact the government has stepped in and*



*said there are only 8 megalitres. And it's no one's fault, but there is this huge uncertainty. When you have crops like vines and trees, they are not yearly crops, they are things that need to be sustained. If you lose a wheat crop it's disastrous but it's only one year, but if you lose your eight or ten years of vines or trees you have a huge problem, so in terms of sustainability it's a very serious matter.*

Participants said the presence of large corporate developments has led to an increase in the cost of water in the pumped districts. These large developments are also able to install big, low-maintenance private water delivery systems, allowing them to deliver water to their property at a much lower cost than is the case with the ageing public infrastructure. Farmers must also compete with private systems in the delivery of water during the peak irrigation period.

One farmer said, 'There has been a push to change to drip irrigation, but if you have to go one or two days without water you can lose a crop'. Another added, 'A lot of these large developments are putting in 500-megalitre dams as buffer storage, but small growers can't do that because their land is fully vined, so they face water restrictions in peak consumption times'.

Others raised further concerns to do with competition:

*These tax-minimisation schemes entered the market but originally they were supposed to be for the timber industry. Water out of district takes away the ability for farmers to redevelop, diversify. Some would have gone into almonds—a gamble—but this option has been taken from us.*

*My biggest concern is Timbercorp and AlmondCo, which are predominantly solicitors, lawyers and accountants being able to utilise that for taxation deductions. I think that is actually wrong and affecting all primary producers. When Timbercorp gets their winery going, the small places are going to struggle. You have people who don't really have the interests of the rural communities in mind, they are in it for themselves.*

There were also concerns about the role of the water trade in contributing to boom-and-bust cycles:

*One of the disadvantages is the emergence of these big tax-based conglomerates. I have no problem with them having a tax advantage, but can they sell the produce? Wine grapes led to an oversupply and a massive slump. This is one of the biggest problems we have as it is a very big wine producing area. There are thousands of tonnes of wine grapes that weren't harvested last year and won't be harvested this year.*

Another participant agreed but argued that such schemes were a fact of life:

*There is a great concern in the Australian psyche about the small farmer being overwhelmed by a large farmer, be it a large successful farmer or a conglomerate. This is just a continuation of the agrarian revolution: the bigger are going to get bigger and the smaller are going to pull out. It's just a fact of life. Where once 30 or even 15 acres of dried fruit was a sustainable area, now I'd suggest 100 acres is the base because of the capital equipment and investment. If you've got a small enterprise you can't afford to experiment and put drips in or increase efficiency. The bigger groups are more likely to be forward thinking and more innovative than the small person. It's a terrible thing but it's the survival of the fittest, and it's been there since time begun and it's not going to change.*

Yet another participant had a different opinion:

*There is a strong perception that managed investment schemes are unfairly competing with small growers because of their huge tax concessions. So they are buying up water and inflating the value of water and flooding the market supposedly with products. But from where I sit most of the schemes produce almonds and olives that don't compete with grape growers.*

Other participants were concerned about environmental flows. Although the majority of people were happy for some water to go to the environment, how, when and where that occurred was a concern in the midst of drought:

*The ability of the river to carry peak flows is in question. When we have a heatwave in January and February the river actually flows backwards at Mildura. So the short-term ability of the river to conduct water is limited.*

*One of the dangers is that a lot of the water being bought may have been licensed as sleepers or dozers, which is water that wasn't being used, so the overall consumption has increased.*

*There is concern about environmental allocation of water. I think they are talking about 14 gigalitres going into Hattah. Of that, five was donated from irrigators. People are prepared to donate any unused water to the environment. Now they have finished pumping the donated water, but there is an environmental allocation that they are putting in a couple of new lakes. There is a fringe group jumping up and down about that: they say we are on water restrictions and you are wasting it on trees.*

## The impacts of water trading on the non-farming community

In order to gain an understanding of the flow-on impacts of the water trade, the authors interviewed owners of industries supporting agriculture as well as the local retail sector.

### The associated industry perspective

One banker was very worried about flow-on effects of the downturn in agriculture for the local economy:

*All of our clients are in the country, with 20 per cent in horticulture and agriculture, but the rest are also in businesses, which are also impacted upon—what you call a multiplier effect. I don't think anyone will escape this. I'm certain of it. It's gaining momentum daily. I'm not saying it's the end of the world, but it's a serious matter.*

When asked if he had made any strategic changes in policy, he replied, 'We are more judicious but, in looking at loans and business deals, we're looking at the downside more than we would have before—much more careful, more discerning. As everyone is'.

An irrigation supplier identified three associated industry companies that had closed down in the last three years. Two he described as large companies. He reported, however, that his business had actually increased as a result of the water trade, although the down side was that it also faced increased competition:

*Water trade is keeping us going. We do a lot of work for large corporate irrigation developments, and that's a key source of our work, which depends on water trade. The scale of developments we are dealing with is huge. So it's been positive for this business. I think the impact of water trade on this industry has come more from competition from large multinational companies moving here and becoming active here. In the last two years there is a couple of large companies and a number of smaller ones that are directly competing with us.*

The owner of one of the wine packaging companies reported that water trading had had little impact on his business:

*Mildura is a good point for central distribution for Adelaide, Melbourne and Sydney. Wine comes from all over, here, as well as Coonawarra, the Barossa, Griffith, Clare Valley. Once the wine is on a truck it's pretty academic how far you take it. So we can take wine from anywhere and be competitive with other bottlers closer to the wine than we are. It's the unloading and loading where all the expense is. So water trade is probably not a big influence on our business. If water is shifted up or down stream from us, the product would probably still come here.*

*Our business has three bits—the packaging, and we can supply the dry goods and bottles as we have better buying power than individuals have. Then there's the storage of the wine, and we can also do a bit of bulk storage as well—about a million and a half litres if need be. As far as our company goes, as a contract packaging company, we're doing a fair bit of cleanskin stuff, which is brought on by this glut of wine. In a way it has probably helped us a little as it has given us a little bit more work, but it can't be sustained, that's for sure. Because there is so*

*much wine around, to get any value out of it you have to package it. You get nothing for it by selling in bulk. A fair bit of it is going out in bulk and being packaged overseas.*

He acknowledged, however, that there had been some industrial growth in the region as a result of the trade:

*Those producing stainless steel, a lot of engineering works that do all the harvesters and that, and that stuff wasn't here 10 or 15 years ago. I think these industries have just grown up to service this particular area, although some sell them fairly widely. There is a mob from Argentina building almond harvesters in town and they send them over to Western Australia and other places.*

*When I first came here, about 20 years ago, Mildura had the highest unemployment in the state; it's pretty low these days. Looking at the papers now there always seem to be a lot of jobs. Obviously, the building industry is a big part of it. It just never ends and I don't understand it.*

### *The central business area*

Interviews were also conducted with members of the local business community who were likely to be experiencing change as a result of water trading. The shire representative reported that unbundling water rights from land will significantly affect the council's rates income as permanent water leaves the district:

*Certainly from the municipal point of view there has been a huge disadvantage from the loss of water entitlements from the area. We've lost \$1.7 million in rate income as a result of the unbundling of water. We are now in the process of trying to get the state government to give us some transitional funding over the next four years to ease the burden on the ratepayers. If they don't fund it or find alternative mechanisms to ease the burden on us, then council has to make a determination as to whether it wishes to forgo \$1.7 million in rates or whether it wishes to transfer those rates across the wider community and increase the rates by about 8 per cent.*

A further concern for the shire was urban encroachment on agricultural land and the growing number of deserted farm blocks in the landscape. The council was seeking to overturn legislation preventing property owners from excising their house block from the rest of the property so that they can sell off the remaining land. At present, house blocks can be separated only from properties of 10 acres or more:

*At this stage the government said they won't change the legislation because it will create a precedent across other areas. We've argued that Mildura is different and this hasn't been accepted. What they have done is given us some money, which we are now matching, to do a study to see if we can justify why we believe we are different and why people on 10 acres should be able to excise off the house and sell the remainder of the block. What we will say is, if they want to do that, they need to sell it to somebody who would link it to their farming enterprise, so it doesn't go out of agricultural production.*

Although some farmers are leaving farming and moving into town, in general there has not been a rush of farms onto the market. A local real estate agent noted that sales of farmland overall have slowed. Even operations with contracts are not selling. Of those who are buying land, about half come from within the community and the rest from elsewhere in Australia. The ability to sell water entitlements has allowed farmers to scale down but continue operating. Land values have fallen, but there are few buyers as a result of increases in interest rates, drought and the downturn in agricultural industries—particularly the local wine industry. The agents try to dissuade farmers from selling their water entitlements.

Participants were also asked about business start-ups and closures in the district. One noted that, although there has been considerable growth in the community, there have been some business closures:

*There are business closures. There is no doubt the downturn in agriculture is affecting that because people aren't paying. Retail is mainly closing. Businesses are going broke. I'm not saying every day, but there is a marked increase in business failures. Anyone starting up would have to be very careful about which area to start up in.*

*And there is not the reliance there was 20 years ago on farming. There is more infrastructure here, professional services, schools, health, etc, which cushions the community, so the wider you get with the economy the less you rely on horticulture. It's very important because it's the barometer of community wellbeing. It's being attacked for the first time. They are talking water restrictions for the first time in 20 years.*

### *The community*

One consequence of the sale of water entitlements for health and welfare services concerns service delivery to the large number of elderly people who remain living in the house on the property after the water has been sold. One service provider explained:

*The elderly on their 10 or 20 acres, they sell off their water rights and they just want to live on their block. But as they get older they find it harder and more expensive to travel in for services, particularly health care, and they can't afford to move into Mildura because of the prices of housing. This is an issue for the whole Sunraysia area because they are demanding more outreach work, but with limited resources it's difficult getting staff out there.*

*Meals-on-wheels delivery is also very difficult when you are dealing with ageing ethnic populations that are not used to pea and ham soup; they want their bowl of pasta. Now we are getting less and less volunteers because most are generally woman, 50+, their children have grown, they don't want to work, they juggle it between being grandmothers and possibly their own interests, and they volunteer their own time but they have to use their own vehicles and petrol to do the rounds. They could easily use a tank [of petrol] a day trying to get to these isolated places and, at \$60–70 to fill a tank, what pensioner can afford that? That's just to feed the elderly. There is the social and medical element of it as well. Most GPs don't bulk bill. Some people won't go because it's costly and the travel [is expensive]. We do have an organisation that picks up people and transports them to their appointments, but that's a limited service.*

When asked about the older farmers who are still farming, she reported, 'We don't have much to do with them because they are healthy and fit and they are troopers that never say die. The only time they become our clients is if something happens and they need physio or podiatry, or they might have diabetes'. She said that these days there was a higher incidence of depression and mental health problems. She also noted an increase in the number of males seeking counselling. She attributed this trend to government advertising and agencies such as beyondblue, as well as some sporting heroes and politicians who have publicly discussed their depression. For younger farm families, the financial and emotional stress being experienced has affected the children:

*What's happening now is, if their crops have gone bad and they have had their water allocation reduced, they are moving from being quite comfortable to all of a sudden the purse strings have tightened. What we are finding is there is a little bit more aggression and truancy in the school system. I just don't know how honest people will be about this. Parents aren't looked upon favourably by the education department if they purposely keep their kids home. We've just had little snippets of this. But its something we make a mental note of so we can monitor it down the track. We may have a couple come in and there are issues with the drought, water trading and no income, and we ask about the children and they say, 'Well, they are not doing too well at school, they are getting depressed, they feel like they are being bullied, so we are keeping them at home'. If you dig a little bit deeper, yes there are elements of depression and bullying; but is it bullying or bad behaviour because things at home aren't right or are the kids staying at home because dad can't afford a picker and the kid is staying home to pick? It could be all these things. Mum probably can't cope; she's probably feeling it all and trying to deal with a partner and keep him positive, and then deal with the kids. It's all too hard—just go with your father.*

The influx of seasonal workers can create problems of additional demand on local health services if the workers are on drug programs. The service provider explained:

We are only licensed for 20 positions, so in February, March when you have a lot of seasonal pickers and they are on methadone and they want to transfer here because they are here for two to three months, it can actually jeopardise our normal client load. And if we say no to them, which sometimes we have to, then they can't stay in the area. We can only fit 20 people in a year.

One project participant outlined the more general social impacts of trade on small communities, particularly in relation to managed investment schemes:

*I think the philosophy of freeing up the market is good, but they need to revisit the reality of the impact. Somewhere you need to draw a line between economics and community and ask, 'Do you want community or do you want development?' These managed investment schemes don't fill schools; they don't help with health; they are a low-people-input industry, which means that they are not community builders. The efficiencies they set out to achieve are also being achieved by good growers. They invested in better irrigation technology, but they have also been the driving force of community growth because they invest back into local businesses and profits don't migrate out of the region. If we can bolster that local home-grown input with education and good medical services, we will get more highly qualified people moving here and they will invest in the district more.*

*There are problems getting labour, people travelling long distances to work, and poor services in the small towns between Mildura and Swan Hill. All those things and other issues tag along behind water trade. Some of these places, like Timbercorp, employ 50 Islanders that come into Robinvale. They get bussed 50 kilometres every day to work. Communities need houses and community support and all those things that come along with rapid growth. They have populations of low-income earners that can't speak English because they are the only ones that want to live out there. Communities welcome development, but it puts undue pressure on their services. The rate of expansion is so rapid they have trouble keeping up.*

*It's interesting because you've got Swan Hill and Mildura, on one hand, rich because of the water trade and then you've got these geographically large but asset-poor dryland shires nearby that have declining populations, like Hindmarsh and Buloke, that are on their last legs because of low income. They have ageing populations, declining towns, declining everything. So you've got this inequity. I guess water trade might encourage some of those farmers to move—certainly those on the fringes that wanted to sell their land have made quite a good capital gain selling out to the large corporations.*

As part of the project, the authors interviewed police officers in each region in order to gain an understanding of changes in crime rates that might be attributed to the impact of water trading. The extent of crime is a measure of community wellbeing. Information was sought on crimes specific to the irrigation industries—such as the theft of water and irrigation supplies and cannabis production. In Mildura there had been a rise in petty theft and fuel theft from farms; local police attribute this to the decline in the local economy and an increase in unemployment. Drug abuse is a concern but 'not out of control'. Police reported cannabis production has slowed with the advent of aerial photography. Production now is smaller but harder to find. The officer interviewed suspected that, with the downturn in wine grapes and dried fruit, there might be an increase in cannabis growing. The only other water-related crime was water fraud: one person had been prosecuted for fraudulently trading water. There were some minor crime problems with seasonal workers.

## Discussion

Mildura has certainly benefited from water trading. Water has flowed into the area, facilitating rapid growth and expansion of the irrigation industries, which has created a secondary industry sector providing support services, although the down side is that it has also increased competition within this support sector. This growth has contributed to the city of Mildura becoming one of Australia's 10 fastest-growing regional centres.



There are high levels of employment—particularly in agriculture and related industries (much higher than national averages)—which can be partly attributed to the water trade. Mildura’s residents talked about the city’s critical mass sustaining and perpetuating the economic and population growth. It is probable, however, that the city would have achieved considerable growth regardless of the water trade since the growth of regional centres at the expense of small rural towns is a trend common to much of regional Australia.

At present drought and a simultaneous downturn in wine grapes, dried fruit and citrus are having a negative effect on the local economy. As water has become a valuable tradeable asset, a number of smaller operators have sold their permanent water entitlements in order to cover debt, retire or leave the industry. This has led to concern about loss of water from the region and the sustainability of smaller outlying communities. It is also a problem for increased frost risk and feral animals, disease and weeds on farm land that has been abandoned.

Closer settlement has meant that the size of properties in the area is 4 to 10 hectares, which seriously disadvantages farm operations in the current economic climate. The presence of so many of these small blocks causes concern for the health and wellbeing of the families living there—especially if they are elderly. It is important that resources be made available to help these families.

## Community views in Robinvale

Robinvale, with about 4500 people, is situated on the Murray River 85 kilometres south-east of Mildura, 136 kilometres north-west of Swan Hill and 473 kilometres north-west of Melbourne. The town is within the Rural City of Swan Hill – Robinvale Statistical Local Area. It is connected by a bridge to the town of Euston in New South Wales. The two towns function as one, servicing a large irrigation district. Among other smaller settlements in the district are Wemen, Boundary Bend, Annuello and Bannerton.

The project fieldwork in Robinvale involved a focus group with a cross-section of the community and some additional one-to-one interviews with several key people in the district.

## Economic profile

Through a series of pipes and channels, Lower Murray Water delivers water directly to individual farms in the Robinvale Irrigation District, which covers 2700 hectares. There is now more irrigation outside the district than in it. ‘Private diverters’, pumping their own water directly from the Murray, irrigate the area between Wemen and Nyah. More than 60 different agricultural and horticultural products are grown in the area. The main crop is fresh table grapes, but there is also large-scale production of wine grapes, citrus, almonds, olives, carrots, pistachios, avocados and other vegetable crops, as well as barley, wheat and sheep production to supply an export market valued at millions of dollars annually. Thousands of hectares of land that is suitable for further new horticultural development and is close to reliable water have been identified for future investment.

Many of the original soldier settlement blocks have been consolidated into larger family holdings. At 10 to 12 hectares, the blocks around Robinvale are larger than the 4–8 hectare blocks in the closer settlement schemes around Mildura. The larger blocks provided more opportunity to sustain a family farm operation into the latter part of the 20th century.

An olive grove established in 1951 is now one of the state’s largest olive plantations and a major supplier of the country’s olive products. The area has also seen large-scale corporate development in horticulture—for example, Boundary Bend Estate. These industries rely on a local labour force supplemented by seasonal workers. In the next two years \$661 million is expected to be invested in 15 horticultural projects in the Robinvale area, which will create 1057 jobs directly and indirectly (Swan Hill Rural Council 2006). A \$40.5 million project funded by the Victorian Government and Lower Murray Water will begin in 2007 to upgrade



ageing water delivery infrastructure in the irrigation district. In short, the economy of this district is vibrant because of the climate, the soils and the potential for large-scale private diversion irrigation close to the river on land currently used for dryland farming (*The Robinvale Sentinel*, 20 July 2006).

As an agricultural service centre, Robinvale provides for local irrigators and dryland farmers rural supplies, irrigation supplies and equipment, harvesting and spraying equipment, packaging and transport facilities. National suppliers of agricultural services, machinery and equipment have outlets in the town.

### Community services

The Robinvale Resource Centre is the office of Swan Hill Rural Shire and is a one-stop shop for several government services (such as Centrelink), a booking office, and an employment agency specialising in farm labour. In the town there are three banks, two pre-schools, one private and two public primary schools, and a secondary college. There is also a hospital, medical clinics, a nursing home, dentists, a pharmacy, allied health professionals and a veterinary surgeon. The local health service provides services to the surrounding district and into New South Wales. There are good sporting facilities and the river offers many recreational opportunities for locals and tourists.

Robinvale is one the fastest-growing small towns in rural Victoria. This has placed increasing demand on local services and facilities. A recent needs analysis of the area found that the town needs public transport, childcare, drug and alcohol services, youth services and recreational facilities (Success Works 2005).

### Community profile

Figure A.5 summarises the community profile of the Swan Hill – Robinvale Statistical Local Area.

### Community strengths

Participants in the focus group were invited to discuss the best things about Robinvale. Diversification within the horticultural industries, rather than total reliance on dried fruit, contributes to the strength and stability of the local economy. The larger size of properties in the district also provides stability. Participants compared Robinvale with Mildura, where smaller blocks that are unviable have been abandoned. Robinvale is also less reliant on the wine grape industry. One focus group member said, 'I think we are in a unique situation because we have people that are pretty upbeat about how the industry is going in Robinvale. People are not walking off the land as in places like Merbein'. Another claimed that rural communities elsewhere would envy Robinvale's opportunities, innovativeness and new industries:

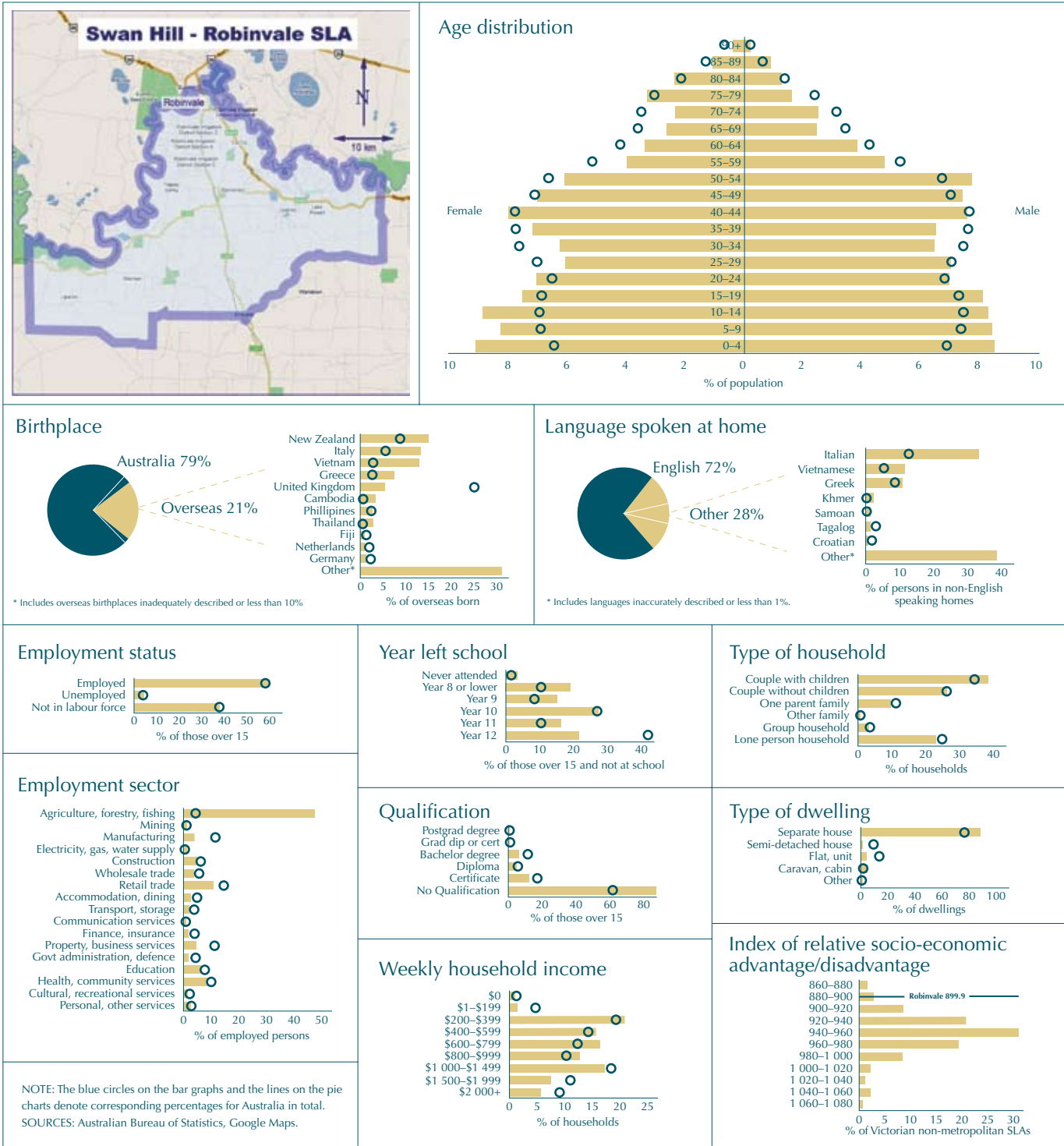
*Mildura hasn't got the industry that we've got around here. They rely a lot on wine grapes and we've got the almonds and pistachios, carrots, olives. They are huge industries. Then you've got all your table grapes, your dryland farmers. We've got a lot more in the way of supporting businesses.*

Growth in the agricultural industries has led to improvements in education, new buildings being constructed, improved sporting facilities (including a newly renovated swimming pool) and a wide range of sporting activities.

The high demand for manual labourers for the horticultural industries has produced a culturally diverse community. The town was described as a 'vibrant and interesting community'. One person said the community was a 'frontier town' that was exciting to live and work in because the farmers and business people were 'can do' people. One of the older farmers added:

*Robinvale has the ability to resurrect itself. If you look where we were and where we are now. The dried fruit trade, it died. We have basically done it on our own. We invented fresh fruit. We've had no support from*

Figure A.5 Swan Hill – Robinvale Statistical Local Area: community profile



*state governments or anyone else. Our hospital was gone, all our services dispersed to Mildura, Swan Hill, all over the place. But our local dried fruit industry people resurrected the town to what it is now.*

### *Community cohesion*

The high demand for labour has created a community made up of people of as many as 40 nationalities. Over 20 per cent of Robinvale's population was born overseas (ABS 2001). In addition, at peak times there are itinerant fruit pickers and foreign backpackers. Italian and Greek migrants came to the district in the 1950s to work in the horticultural industries. Many of the properties in the district are now owned by second-generation Italians whose parents worked the land and then bought it. New workers are now brought in from the Pacific Islands, Vietnam, Cambodia, Thailand, Africa, Afghanistan and Iraq. Census data show that 25 per cent of people speak a language other than English at home (ABS 2001).

Pacific Islanders, predominantly Tongans, arrived in the 1980s and now form a sizeable part of the community. They generally do unskilled work, and many do not speak English. The Tongan community has extensive community structures, including their own church, but this means they tend not to engage with the wider community. Although there were traditional owners of the land, the current Indigenous population originated from elsewhere, settling at about the same time as the soldier settlers. About 500 Indigenous Australians live in Robinvale.

Robinvale has limited social cohesion because of the number of different cultural mores and values. There is tension, particularly between the Tongan and Indigenous communities (Success Works 2005). Participants interviewed for this project were asked to rate the level of community cohesion; the average rating was two (where one means not cohesive and five means highly cohesive). One of the residents interviewed reported:

*The Vietnamese sort of tend to keep to themselves. We have two Asian groceries up the main street. I was there the other day, and it's really fascinating to see some of the locals shopping there. Probably five years ago they wouldn't have gone in. There are a few issues between the Kooris and the Tongans, which are beefed up as racial problems, but it's usually a family thing with intermarriage. There are certain Koori families that don't get on with the others. But the rest of the population I really honestly believe we co-exist quite well. It's just a matter of time; you know, the original Italians and Greeks, they are Aussies now. They are the old generation, so now we have the Vietnamese and the Cambodians and all the rest. It will be interesting to see in 20 years where we are.*

She added:

*We have around 60 temporary protection visa holders from Afghanistan that came here about five years ago. Other than the girls here, they probably don't know any other Australians. They tend to keep to themselves, but they are gorgeous. A lot of the ones we dealt with have stayed here. Some come and go. When we first knew them they used to come in and cry because they didn't know if their wife and kids were dead or alive. So we cried with them, but now their families are coming and that's really pretty special. The community is fragmented, but then at the bridge opening there was a couple of thousand people there and in that sense there is a community to get that amount of people to turn up for something like that.*

One person who was interviewed commented on how difficult it was to engage the entire community in sporting activities:

*I was involved in the football club. And it just gets harder and harder to put a football side on the field because there are just not the races of people that play Aussie rules football. The odd Islander or Tongan or Maori will play, but the Asian, Middle Eastern people don't even come and watch a game. We used to run days where we would*

*give out 50 to 100 tickets to the Asian community. They would come along and would have a lovely time because they love having a beer or a sausage on the barbeque, but they would never pay and bring their family to come watch the footy. It's just not in their culture.*

*And not many Italians or Greeks play footy. Actually, our local coach for three years was of Italian descent. And if only he was probably six inches taller he would have played for an AFL side, but he was just too little. But that's the problem. About 16 years ago when I first moved here there were 10 cricket teams in a competition—eight in Robinvale. Now they struggle to have two teams to play in the regional association. And there are fantastic sporting facilities. Great golf course; great cricket facilities.*

### Community problems

On average, the population of Robinvale grew by 1.6 per cent between 1996 and 2001. As at June 2004 the Australian Bureau of Statistics estimated that Robinvale had a population of 4042, but it is widely believed that the actual population is double this figure. A study commissioned by the Swan Hill Rural City Council (Success Works 2005) found that census data did not reflect the true population counts for three reasons. First, the census is taken in August, a quiet time for the horticultural industry, when much of the itinerant labour force is absent from the area. Second, many casual workers board with others or live in picker's huts or caravans and are unlikely to be identified by census collectors. Third, many new migrants have a distrust of government officials and might not complete the census form. Despite attempts by the local council to encourage people to complete the census form, before the 2001 census the Immigration Department came to the town looking for workers who had overstayed their visa or were working illegally.

Census figures determine service provision, so the town is underserved, particularly in relation to public housing. Using a range of data—birth and employment records, hospital admissions, school enrolments, supermarket

transactions, and so on—the Success Works study estimated that the true population for Robinvale was between 6000 and 8000, rising to 10 000 at the peak of the harvest season, from February to April. Furthermore, there is considerable population instability as workers regularly leave to follow the harvest (Success Works 2005).

The lack of housing for the large workforce required to sustain local industries is but one of the problems faced by this community with its large numbers of migrants. Just over half of all dwellings in Robinvale (58.9 per cent) are privately owned or are being bought; this compares with 66 per cent nationally. Over 30 per cent are rented, compared with 26 per cent Australia wide (ABS 2001). Success Works (2005) found that, although there is land available, many local people cannot afford their own home. Investors were not inclined to invest in the rental market because of the expected low returns and the possible calibre of tenants. They viewed housing in Robinvale as a government responsibility. A local real estate agent reported that at any one time there are 100 people on their rental waiting list. In peak season some workers live in uninhabitable structures, and multiple families of up to 20 people occupy some homes. Pickers' huts, built to provide temporary accommodation, are now used for permanent accommodation for families. Sheds in the industrial area also become homes (*The Robinvale Sentinel*, 4 August 2005). One resident reported:

*We keep fighting for extra public housing or low-income housing, but everything is based on the census figures but we can't get a true figure. Robinvale is made up of soldier settlement blocks of about 25 acres. They don't exist anymore. People now might have two blocks and some of the bigger growers have amalgamated several. They all have picker's huts on the property so the workers live in those. One of the bigger growers is putting in accommodation units that accommodate 100 people. The growers know that if they want the workers they have to have accommodation because there are no backpackers hostels apart from an old hotel in Euston.*

Success Works found Robinvale to be very dependent on retaining a substantial workforce. At times in the peak season, only half the available positions are filled. Jobs are primarily seasonal and unskilled. Nevertheless, there is a sizable group of long-term unemployed—particularly in the Islander and Indigenous communities. Although developing projects in the region will provide over 1000 jobs, there are concerns that, although local people will take up some positions, many new residents will be employed. This will place further pressure on existing services. It is believed that newcomers are unlikely to settle permanently in the town and contribute to the sustainability of the local economy because of the lack of appropriate education, housing and services (Success Works 2005). This current project revealed similar concerns. One farmer reported, ‘At the moment we are two people short on our property. We process and pack pistachios for most of Australia. We can’t find people to come and work, and I’m sure other people are short as well. I interviewed a person a few weeks ago; we got them over the line, but they couldn’t get a house’.

Success Works also found there were low levels of English language skills and literacy among the immigrants. Confusion about immigration provisions contributes to a low level of compliance with official requirements such as the census. Some immigrants were living in the country illegally; others did not have a valid work visa. There is also concern that casual labour and low pay create high levels of poverty. People working illegally might be most vulnerable in this regard. A lack of childcare and adequate parenting was another problem. Some children are cared for by older siblings while parents work; these children begin school lacking basic skills and discipline.

In addition, Success Works found there was a lack of strong leadership in the community because of the social difficulties that must be overcome; the consuming nature of horticulture, which leaves little time for civic commitments; and, for many, a lack of ‘attachment to place’. This could, however, be improving: this current project found a strong sense of commitment to the community and leadership—especially among residents who participated in the focus group.

The local Progress Association is very proactive.

Population instability and ethnic diversity are factors that are predictive of increases in crime rates in a community (Sampson & Groves 1989). Police officers interviewed for this project noted that the increase in the population had led to an increase in the incidence of crime. Assault, domestic violence, petty theft, and alcohol and drug abuse were the main types of offences occurring. There are also thefts of irrigation equipment from the large managed investment scheme operations. Recently, \$8000 of sprays and seeds had been stolen; another theft involved sprinkler heads. The offenders were found to be locals. The officers noted there were no reports of water theft or drug production.

The police acknowledged that there was friction between Indigenous and Tongan groups—particularly among young people. Several project participants referred to a recent incident in which young people had vandalised trees that had been newly planted in the town. The local council has called for a 24-hour police station to control problems with graffiti and malicious damage in the town. This has led to the town receiving some negative publicity, the media describing it as ‘another Redfern’. Police are working with Indigenous community leaders and with young people to redress the situation.

Focus group participants were defensive about the bad press the town receives in relation to ethnic tension in the community. They insisted that the problems with the Indigenous population are overstated. They were, however, concerned that new arrivals (immigrant workers) should be given long-term opportunities and be welcomed into the community since there is potential for social disruption.

One police officer argued that crime was not a problem in comparison with neighbouring towns such as Bendigo. He noted that the majority of immigrants are there to do the manual work in the horticultural industry and are not interested in causing trouble: ‘Trouble comes from those who are more educated, are less inclined to do manual labour and have more time on their hands’.



## The impacts of water trading on the farming community

Of all the communities studied for this project, Robinvale appeared to be the most vibrant in terms of a rapidly growing, affluent horticultural industry. The area has been a major importer of water, which has attracted and sustained significant investment in the area. As noted, the diversity of commodities produced in the area has provided economic growth and security. Project participants were proud of their community and its achievements:

*Robinvale is a community that most communities of this size in Australia would be absolutely envious of in this time of drought and water losses because it's a community that is going ahead. It has heaps of opportunities and stability, even though there is a move in industries from dried fruits to table grapes. These new industries will be able to take on new technologies, which will put Robinvale at the forefront. I think the challenge for Robinvale is to self-promote. It has a lot going for it; it has a bright future and the young growers are certainly evidence of that.*

Of note was the retention of younger farmers in comparison with surrounding areas. Two focus group participants were farmers in their late-20s; one said:

*I think one of the best things is the retention of young farmers. You look around at other industries and other regions; you are looking at a lot of old farmers with no one to take over their farm. There are a lot of young farmers staying in Robinvale who can see the benefits of farming here, and that's definitely going to be strength to carry the community forward.*

These values reflected the strong work ethic prevailing in the Italian community, as identified in previous studies (Success Works 2005). One young Italian grower of table grapes questioned the provision of exceptional circumstances payments to people in the dried fruit and table grape industry. He wondered if these farmers were facing exceptional

circumstances or just tough times. His view was that people should be able to pull themselves out of these situations and prepare for extreme weather events by taking out insurance:

*Our industry has really been through a rough trot, and it just took a lot of hard work by a lot of people to pull themselves out. It's disappointing to hear that the exceptional circumstances scheme is being extended to dried fruit and wine grape growers. It's only really been the last two or three years that table grapes have been good. There have been tough times, and it was up to us to pull ourselves through. A few of the farmers experienced frost damage, but most were lucky enough to have a successful year and insure their crop. Now in the Shepparton district where they have been frosted, the government has been there to support them. In Robinvale farmers have taken the initiative to insure crops. Robinvale has gone from a wine and dried fruit area because the local people took the initiative to convert to table grapes because it was perceived to be more beneficial for them. If we'd stuck with wine and dried fruit we'd be a basket case like other areas. If we didn't generate wealth for ourselves and move into areas that are going to be more profitable, we wouldn't be employing people who would be spending in the town.*

When questioned about the value of supporting farmers to sustain rural communities through difficult times, he responded:

*I don't disapprove of the assistance that's been given. I'm saying that when the table grape industry was having trouble you never heard of it. It's frustrating. I'm not saying that farmers should or shouldn't get something. I'm just saying we pulled ourselves through. Robinvale is the way it is not because of good luck but because of hard work and initiative.*

Participants described Robinvale as unique because more people have benefited from water trading and fewer people are leaving the district compared with other towns in water trading zones of Victoria. One participant commented that



it is better for water to be used on more productive land around Robinvale than on degraded and unproductive land. Salinity-affected land near Kerang was cited as an example.

The focus group discussion centred on the large number of managed investment schemes in the area that have evolved since the advent of water trading. Participants believed, however, that there was an inherent risk for the community should these schemes elect to move their operations elsewhere:

*The managed investment schemes, if the government knocked that on the head that would certainly make a difference. Because the economy is based on horticulture, there is always a certain element of risk, particularly with grapes. There are so many things that can affect you—frost at the wrong time, rain at the wrong time ... heat. If it gets too hot and people can't irrigate at the right time the grapes can suffer heat stress. There are a lot of things that can go wrong. If the river dried up it would be fairly grim—the end of all of us I'd say.*

## Perceptions of water trading

### The benefits

One of the project participants advised that water trading in the district is primarily in permanent entitlements. The reason for this is that the type of horticultural production demands a consistent, reliable amount of water. He also noted there was a trend for local farmers to own their own land and their own plant, and they therefore prefer to have their own water. A small amount of temporary trade is conducted for farmers who have sold their permanent water. Temporary trading is mainly out of Robinvale to grazing operations downstream.

In his view, the market has allowed the industry to diversify and ride out commodity boom-and-bust cycles. Permanent trade has allowed farmers to repay debts or retire. Others have been able to build up their enterprise by buying out a neighbour who has sold water. The people who have

benefited most from the market are the well-organised family farm businesses. He maintained that the managed investment schemes have brought many jobs to the district—jobs that would not normally exist. This trend will continue, along with opportunities for young people wanting to enter farming.

Focus group participants agreed that water trading had brought wealth and growth to the area and many people have benefited. One added, 'It's all about confidence; it's confidence that is keeping it all buoyant. Yes, we are making money, but in reality market forces are controlled by confidence'.

### The costs

An irrigation industry representative spoke of the danger for producers who sell part of their entitlement and, with reductions in allocations, do not have enough water to function. The people most disadvantaged by water trading live in the areas that have lost water. He maintained there was a mistrust of government assurances in relation to water allocations.

Project participants were concerned that large managed investment schemes consume a great deal of water and place stress on the river and associated delivery systems, especially during peak times (summer). The schemes are considered an unwise use of water in a time of drought. One participant said:

*I think the biggest issue to do with the water is that we have tax minimisation schemes coming into the area and using a lot of water to irrigate dryland farms. Water is brought in from other districts or from sleeper licences, which places stress on the river systems. With the drought as it is at the moment, it's illogical the amount of water that is being used and is still brought into the area to be used on totally unirrigated properties. In the heat of summer it is going to be a problem for everyone.*

Another argued, however, that these large corporations have done much to improve water conservation:

*Can I say something positive about MISs because I think we always seem to be kicking them? Now there was a lot of water used in the flats near Boundary Bend as flood irrigation. The MISs are taking all that over, so we are not using the floodplains anymore to create that water loss. Water is deployed in low-impact zones and I think that is a plus. Those kinds of places like the river bends are given back to the environment—planting more trees and everything. It's great.*

Participants mentioned the Barmah Choke, concerned about what will happen to irrigators in Robinvale when the drought is over and New South Wales irrigators want water. Smaller operators are unable to compete:

*The drought obviously is extremely important. The 10 or 11 inches of rain, which is our average; as long as that falls at the right time, the broadacre farms are going to do pretty well. But if it doesn't rain up in the mountains, horticulture will be dead. I would hate to be the person telling some of our really strong and good table grape growers they would only get 50 per cent of their water. I suppose the more established wealthier ones will find some water to buy, but blokes that are struggling and wouldn't have money to go out and get an extra 50 megs ... will be in deep trouble.*

## The impacts of water trading on the non-farming community

The impacts of water trading on local industries that support agriculture as well as the local retail sector were discussed in the focus group.

### *The associated industry perspective*

Local industry supporting dryland cropping and horticulture has expanded in keeping with the increase in horticulture in the region. The presence of large corporate operations and large family farm businesses has contributed greatly to

the local economy. One participant described the growth: 'Irrigation places, machinery places, and tyre places: they are all new. The industrial sections over the railway line in Moore Street ... eight years ago there were only 10 businesses'.

Another participant noted that some of the businesses in irrigation supplies, fuel, and car and machinery mechanical repairs were doing very well. When asked about the impact of water trading on his business, he replied that, where once he had been the only agency in the area, with the growth in the economy four years ago he suddenly found that within a six months he had three competitors:

*It's really tough, the competition. Businesses across the road and next door that keep selling so cheaply make it twice as hard. With places like these 30 000 acres of almonds, all their business is quoted. They never walk in and say I want this. If they get a particular type of fertiliser for the season it's not \$10 000 worth, so the margins we make are so small because everyone wants a bit. Even some of our table grape growers, instead of having 25 acres, they now might have 8 or 10 of those properties and, because the inputs in table grapes are fairly substantial, they almost become corporate growers themselves. So they are tending to shop wider as well—not so much out of town but certainly because there are four of our type of business here. We are all in the same street and, because we know that we have to compete, we keep prices down.*

Yet another participant noted that tradesmen were being monopolised by large operations: 'Robinvale has about eight plumbers, which is amazing for a place this size. But they are working flat out and you just can't get anyone when you need them'.

Some businesses benefit more than others, though. Some services—particularly manufacturing and engineering businesses that compete with those in the regional centres of Swan Hill and Mildura—have been bypassed by the larger operations. The owners of a local engineering business reported that their business had dwindled from employing 11 people to employing only three family members. This

business was not supported by the larger farms. Similar businesses in the industrial area have all but disappeared. Focus group participants said managed investment schemes also source tradesmen from Mildura, instead of using locals. This is reducing Robinvale's manufacturing and service capacity: 'The big concern now those MISs ... they have millions of dollars and are bringing in huge contractors from outside to put that infrastructure into the ground, and we don't get any of it'.

A representative of one of the large operations pointed out that outsourcing is the way business is done now: people want the best deal and the most competitive price. He also noted that many products and services are not available locally. For example, there is only one car dealership, which limits choice for people wanting to buy a new vehicle. He added:

*In terms of buying locally, we just put a roaster in. Robinvale can't supply the roasters to us. It came from Spain; the bloke flew out. Swan Hill engineering built our shed. It's a large shed but we did it locally; the local builder did the concrete work. We could have got an outside contractor—could have done it better—but as we went down we got closer to town and used what we could.*

### *The central business area*

The central business area is also doing well, although some businesses—such as those providing essential services—might be doing better than others. There appears to be some instability: 12 of the local businesses changed hands during the year leading up to this project. Some of the businesses are owned or managed by Asian immigrants, and two Asian supermarkets have recently been established. One participant observed, 'Over the last six years, people have been looking for shops in the main street of Robinvale. There is not one empty shop, and that's unbelievable in a small Mallee town'. Another added, 'I think the supermarket does pretty well, and one or two Asian supermarkets in town are going OK. And the takeaway food shops do pretty well'. Participants attributed this advance to the water trade: 'The water trade

has only meant good things for Robinvale and over the river at Euston. Without water trade, none of this development would have happened, and it's still happening'.

Focus group participants felt that the wealth created in the region should stay in the region. They acknowledged that some money is spent in town but said immigrant workers send a great deal of money home, and short-term workers take their earnings with them. One business owner reported that some businesses were not well patronised:

*The people who have been brought in as the labour force for this growth are not renowned for spending their money in the towns; more of their money goes overseas. So the business community as such is probably at the lowest period it has ever been in Robinvale in about 30 years. Somehow we have to try and get the labour force to be more permanent so that the community can thrive.*

Participants expressed a wish for research to explore the long-term impacts of water movement between regions. They were aware that economic prosperity and employment in their region have come at the cost of economic decline in other regions, as water is sold from one place to another:

*As far as Robinvale is concerned, the change appears to be all positive, but often the positive changes have their harmful side in the sense that it has a social impact far beyond Robinvale. The removal of water from other communities is very painful for businesses, and we did not expect it to be exacerbated by more general water shortages. It's a finite resource. The more you take out from the water source and convert into income dollars in terms of almonds etc ... those are benefits which are felt by the market, by the economy, but they are not benefits felt by people who can no longer water their gardens for their recreation or enjoy the other social things that water brings.*

Consideration of this led to concerns about the potentially transient nature of the large managed investment schemes, since there is potential for water to be lost from the Robinvale region if these businesses move elsewhere or fail and are

forced to sell their water entitlements. There is also the risk that investment in infrastructure to meet the needs of the big schemes could be unwise: they can easily ‘walk out the door if they don’t consider it worthwhile to stay’. Investment in infrastructure could therefore be ‘putting the cart before the horse’. One participant elaborated:

*There are intrinsic risks for the community. We have seen the effects from development on other places. In our case it’s the availability of transferable water and tax leverage developments. But the benefits could also walk out the door. There are risks associated with political issues and the possibility that the population at large will say that’s enough of new developments. There is a serious question mark about the deployment of long-term commitment of water. And if we are going to be exposed to the possibility of actual losses of water entitlements, and these rights start to evaporate, well, that’s a risk factor that really needs to be worked on. We can’t afford to have a community going ahead with big infrastructure commitments and all sorts of things if your basic reason for being there might be taken away even in small increments. Consistency and certainty in investment are pretty fundamental, and the big companies know that but they are not going to worry if all of a sudden Robinvale goes south. That’s why I think the diversity of economic development is pretty crucial.*

## *The community*

A number of social considerations arise as a result of new arrivals flocking to the town to take advantage of the employment opportunities created by the rapid economic growth resulting from water trading. One participant noted that the opening up of the water market has had positive effects such as increased prosperity and employment. But there have also been some negative effects, such as the shortage of housing and professional and health services. He noted that the changes have come so quickly people have been caught off guard. Although the community is seeking to resolve these difficulties, they should have been dealt with before water trading began.

Another participant added that ‘social responsibility needs to be built into these schemes’ so that they provide, or contribute to the provision of, local infrastructure. A further concern was that people employed by managed investment schemes do not integrate with the local community: ‘They are not going to sit on the school board’. Yet another participant commented:

*We are a mining town of sorts on some level. The contractor comes in, does the job and leaves, and they will not bring their family [here] until they know if they are going to settle. Therefore they are not spending their money, their kids aren’t going to the school, they are not playing at the sporting club. Their money is not coming into the town; it is going into their pocket. The owners of small family farms are more involved in the local community.*

A member of a large operation responded, ‘We are a family-run business, and my direct boss is on the board. His ethos to me is to get involved in the local community, be on the tennis court, the local growers’ groups’. Another noted there were opportunities to turn things round:

*Robinvale is moving from being a receiver of services to potentially being an exporter of services and expertise. And some of the service industries have yet to reach their full potential. It is an exciting opportunity for government, business and service agencies to invest and start to plan appropriately. Given that they missed the front-door entry, they still have an opportunity to make a real difference and support the continued growth and development. But there are inherent risks that if governments don’t focus on it businesses do not work in collaboration and the community doesn’t get engaged. It could fail.*

A shire representative added that these organisations are beginning to consider their impact and said council is developing a master plan to deal with social concerns:

*We are actually working with the big horticulture growers, and they’re basically the ones pushing this. They have agreed that they really should have been sitting down earlier and looking at the social impacts of what they are*

*doing. So we are working with community groups and looking at doing a master plan. The consultants are just about to start, and it will be a process of speaking to the community groups to try and map out where things are going and get services in place as soon as possible by lobbying governments and private enterprise for investment.*

These points were nicely summarised by a focus group participant: ‘Economics will take care of water allocation, but government and we [the people of Robinvale] will need to look after the social impacts associated with it’.

## Discussion

Like Mildura, Robinvale has benefited greatly from water trading into the district. With good soils and a good climate, the area represents the quintessential ‘place of higher valued use’ of water. Several large corporate horticultural operations are established in the area, and the town is growing rapidly. Robinvale is an example of the heterogeneity of rural communities in Australia. It is a complex community that faces major social problems that are a direct consequence of the rapid economic growth in the irrigation industry that has been facilitated by the availability of water through water trading. The high labour demands have placed great strain on the town’s infrastructure and caused difficulties with community cohesiveness and crime. The community faces a challenge in meeting the needs of a diverse range of people and lifestyles.

Despite this, there is a buzz in Robinvale because of the economic growth and the perceived unlimited possibilities for the horticultural industries. Perceptions of the benefits of this economic growth differed, however, between project participants. For the large managed investment schemes and the wealthy family businesses in the district, along with some of the businesses that support them, the water trade had been most beneficial. Some businesses have benefited more than others. Immigrant workers tend to send a large amount of money home, and short-term workers ultimately take their earnings with them, which means the local economy is deprived of some income.

Robinvale has experienced uneven social development as a consequence of uneven economic development (Furuseth 1989). A greater concentration of capital and development alters the quality of places, labour and industry, leading to greater opportunities for some while others are excluded. These inequities cannot be corrected by the free market (Furuseth 1989) because water markets are concerned with the efficient allocation and use of water rather than the perceived equity concerns associated with such a distribution.

There is a need for more support for communities such as Robinvale, which have undergone rapid economic development yet do not have sufficient resources to sustain such a large immigrant labour force. The community has been trying to accommodate and meet the needs of a diverse range of people and lifestyles. This is a daunting—perhaps impossible—task when the demands of the mobile population outstrip the publicly funded resources they require.

## Local case study: a Robinvale fruit producer

### *History of the family farm*

Phillip Natale represents the second generation of his family to farm in the Robinvale Irrigation District. His father, who emigrated from Italy in the late 1940s, bought the original farm in 1964. Phillip has expanded the property by buying



Rows of vines on the Natale family farm





An irrigation channel

an additional six blocks, giving him a total of 90 hectares. For many years this land was used to produce fruit for the dried fruit industry, but when that industry went into decline Phillip's family experimented with wine grapes for a short time and then switched to table grapes. Phillip manages the property with his two sons and intends that the farm will be passed on to future generations of his family.

### *Involvement in water trading*

The land Phillip farms was bought under the old system of water licensing, where water was attached to land title and was traded with the land. Phillip considers his current water allocation sufficient for his property and has no interest in participating in the permanent water trade. He is adamant that water should not be sold separately from land and speaks of the 'unforeseen down sides'—for example, when property owners sell their water and leave the land unmanaged. His brother has a farm adjacent to an unmanaged block of this kind: the vines have not been cleared and the land now acts as a source of weeds and disease.

Phillip is also concerned that outside investors in the water trade are too removed from the local area to understand the impacts of water trading on the Murray River and the communities that live along its banks.

### *Life along the Murray River*

Phillip has lived on the banks of the Murray all his life and has memories of boating along the river and its smaller creeks. He worries about the permanent water trade having serious consequences for the health of the Murray because the high price of water has removed the incentive for irrigators to allow unused water to remain in the river for environmental purposes. He said of himself, '[I] still had 50 or 60 megs left last year, and I gave it to the environment rather than selling it ... I could have turned it into dollars and I thought, no, I'm not using it. Leave it there. It will flow on to the trees and keep the old red gums going'.

Phillip has further concerns about the river's ability to transport high flow volumes to downstream users. And he



is anxious about the over-allocation of water, the impacts of which will be felt as previously unused licences become active. As he put it:

*What's going to happen to this river? I'd like to see my grandchildren see it through, and the way they are handling it, believe you me, I reckon in 50 years' time there won't be a river, the way they are going. You can't drag so much out of it. No one puts nothing into it. What's going to happen to it?*

### *Life as a resident of Robinvale*

Phillip has no plans to leave the Robinvale district. Most of his immediate family also live in the district. He is proud of the area:

*Good lifestyle, it's alright. It's a nice place, very nice place. I don't mind it. Plenty of work, we get a steady income, that's all we want. It's a great community—got a football side, got swimming pools ... We've got [an] absolutely glorious little club up here ... Got the river around us .... And it's a lovely little community.*

## Summary

Water trading has had a significant impact on the Sunraysia region in the last decade or so. A large amount of water has been traded permanently into the region at the same time as temporary water has been traded out. Private diverters have been the buyers of water entitlements, and water has been permanently traded out of the pumped districts.

Various factors were seen as contributing to the observed patterns of water trade in the region; for example, the ups and downs of the wine grape, table grape, citrus and dried fruit industries have been a central influence. Further, the development of greenfield sites by managed investment schemes has increased the demand for water.

Irrigators in the region see a range of benefits and costs associated with water trading. On the plus side, they recognise the ability of the water trade to facilitate business growth, help them manage their capital and adjust their cropping practices, and assist with cashflow and debt management. On the negative side, irrigators were concerned about increased competition in horticulture, the risk of stranded assets, and the adverse impacts of unmanaged vineyards. They are also concerned about the impact of the managed investment schemes.

Importing of water into the region has led to considerable growth and expansion of major centres in the region. This growth has contributed to Mildura becoming one of Australia's 10 fastest-growing regional centres. At present it has a population of 51 263 and is an important service centre. There are high levels of employment—especially in agriculture and related industries (much higher than national averages), which can partly be attributed to the water trade. Mildura's residents spoke of the city's critical mass, which was sustaining and perpetuating the economic and population growth. Mildura's growth cannot, however, be attributed entirely to the water trade: the growth of regional centres is common throughout rural Australia.

Drought and a simultaneous downturn in wine grapes, dried fruit and citrus are currently having a negative impact on the local economy. Water has become a valuable tradeable asset, and a number of smaller operators have sold their permanent entitlements to cover debt, retire or leave the industry. This has led to concern about loss of water from the region and the sustainability of smaller outlying communities.

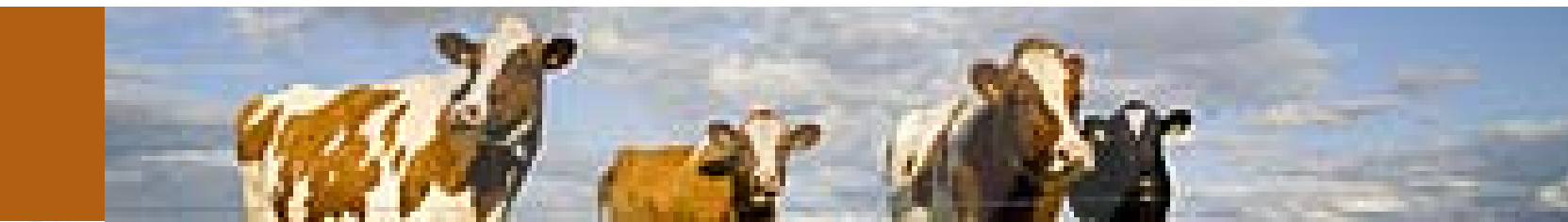
The other centre of focus in the region was Robinvale, with a population of 4042. Like Mildura, Robinvale has benefited greatly from water trading into the district. With good soils and climate, the area represents the quintessential 'place of higher valued use' of water. Several large corporate horticultural operations are established in the area, and the town is growing rapidly. It is an exciting place to be because of the economic growth and the perceived unlimited

possibilities for the horticultural industries. For the large managed investment schemes and the wealthy family businesses in the district—along with some of the businesses that support those enterprises—the water trade has been most beneficial. Some businesses have benefited more than others. Immigrant workers tend to send a large amount of money home, and short-term workers ultimately take their earnings with them, which means the local economy is deprived of some income.

Robinvale is a typical boom economy, and with that boom has come social structural change. The high labour demands of the horticultural industries have led to considerable in-migration of workers from diverse ethnic backgrounds, and this has strained the town's infrastructure and services and

created problems associated with community cohesiveness and crime. The difficulty of obtaining census returns from these in-migrants means that, although the town has an official population of about 4000, it is thought the actual population could be twice that.

In summary, the case study revealed a mix of views on the impacts of water trading: while it was widely recognised that water trading has underpinned much of the growth in parts of the region, there was also widespread concern about the consequences of changes in land use associated with the trade. Many people also said they had difficulty untangling the effects of the water trade from other factors, such as drought, commodity price changes, and the trend to farm aggregation.



## Case study B: Pyramid–Boort

### Introduction

This case study is one of three studies to form part of a project examining the social and economic impacts of water trading, with the objective of informing policy in this regard. The project focuses on regions where water trading is prevalent—the irrigation districts of Goulburn–Murray Water and Lower Murray Water, on the Victorian side of the Murray. In particular, it seeks to quantify and report on, through the case studies, the actual impacts of water trading on individual water entitlement holders, industries and communities in the Murray Valley, in order to test the assumed benefits and perceived concerns arising from the trade. The information examined was collected through a series of interviews and consultations in the case study regions, involving irrigators and the broader community.

Apart from Pyramid–Boort, the regions studied were Sunraysia and, as a group, Rochester, Central Goulburn and Kerang–Cohuna. Much of the material presented for the Pyramid–Boort study reflects local people's views about their experience of water trading, rather than the authors' views and analysis, which are presented in Part One.

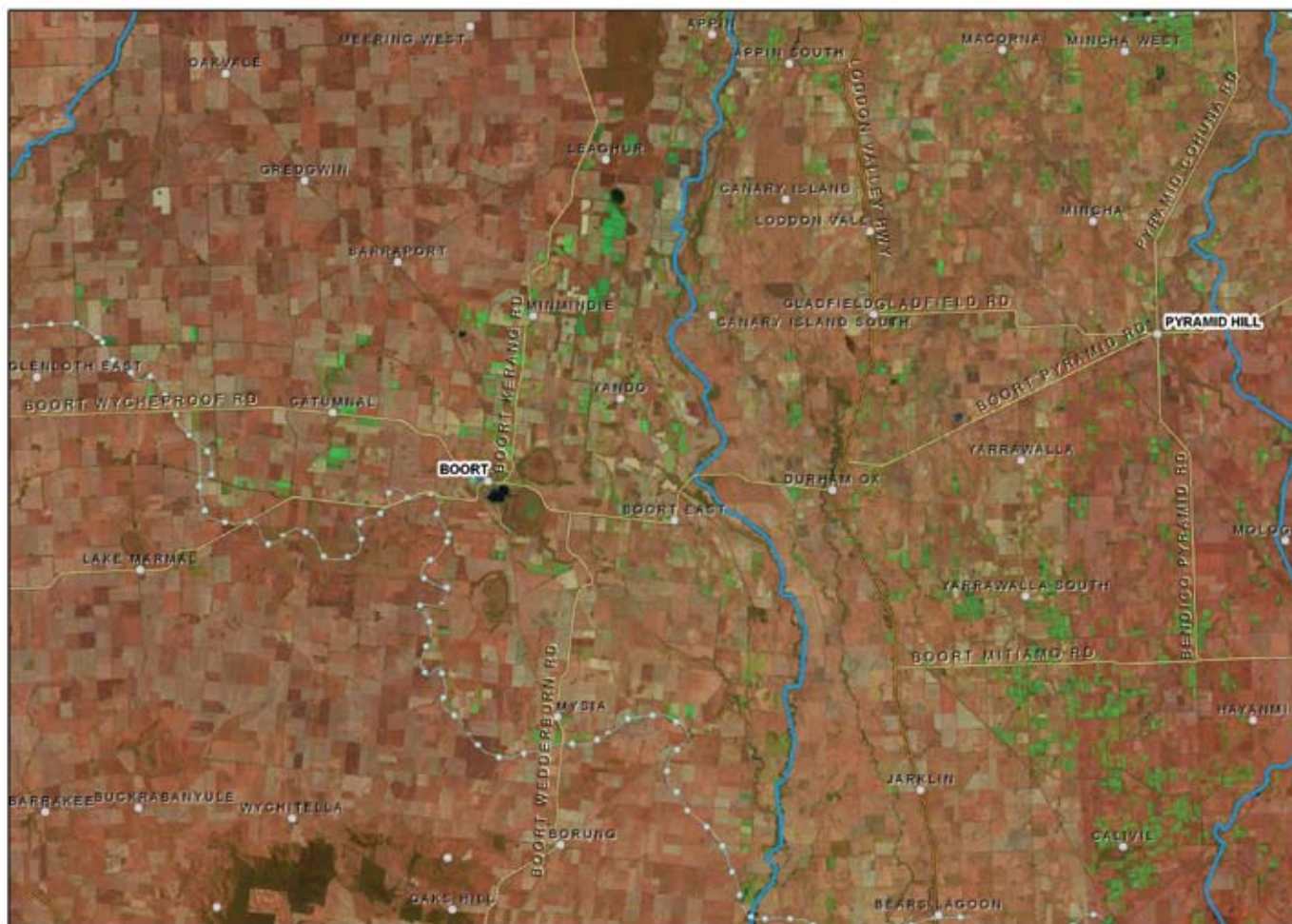
This case study is structured as follows. After a brief description of the Pyramid–Boort region, the pattern of water trade into and out of the region in the past decade is

described. Focusing first on irrigated agriculture, the study then examines the main forces—irrigation history, institutional settings, and the changing fortunes of particular products and industries—affecting this water trading and the costs and benefits of the trade, predominantly from the perspective of those in the affected industries. The study then looks at the experience of those in Pyramid Hill and Boort, again largely from the perspective of the people interviewed. The main lessons from the case study are brought together in the concluding summary.

### Location

The Pyramid–Boort Irrigation District covers 166 215 hectares, of which 126 400 hectares are suitable for irrigation. Among the townships in the area are Tandarra, Dingee, Calivil, Bears Lagoon, Durham Ox, Boort, Pyramid Hill and Macorna.

The Loddon River flows through the area. Goulburn–Murray Water supplies the Pyramid–Boort Irrigation District by gravity-fed channel water from Lake Eildon, via the Waranga Western Channel. About 1250 properties are serviced in the area, by means of a network of 150 kilometres of natural waterways and 1391 kilometres of constructed distribution channels. Water entitlements in the area amount to 234 729 megalitres (Goulburn–Murray Water 2006).



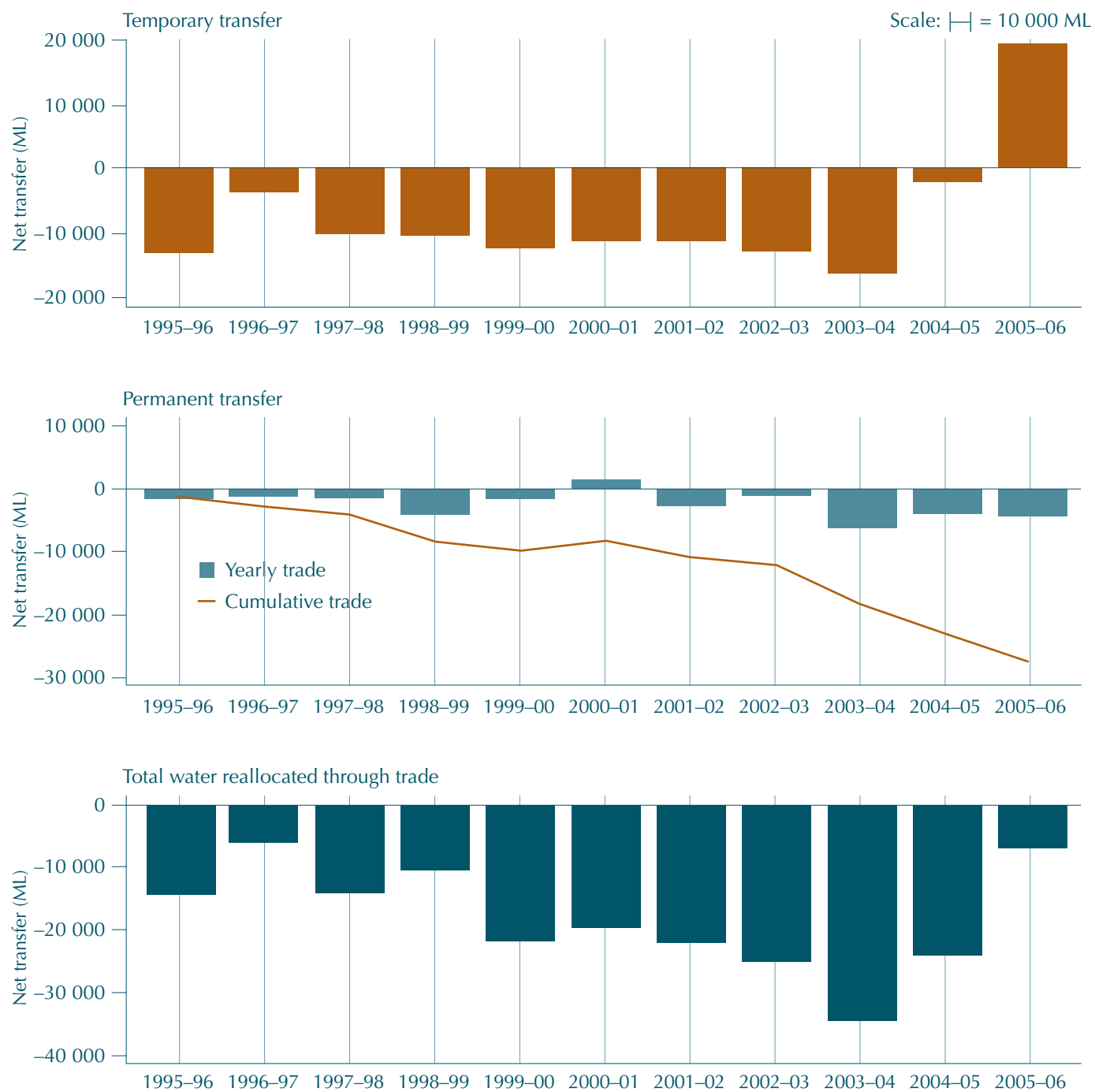
Source: Murray–Darling Basin Commission.

## Patterns of water trade

Compared with the other regions studied, the Pyramid–Boort sub-district of Goulburn–Murray Water has had a very different trading history in that it has been selling both temporary water allocations and permanent water entitlements in most years. In 2004–05 and 2005–06 there was a change in the trend of temporary market (net) selling. Less water was sold out in 2004–05 and then water allocations were traded in in 2005–06; this compares with the approximately 10 000 megalitres traded out of the district in each of the

seven preceding irrigation seasons. In the irrigation seasons of 2003–04, 2004–05 and 2005–06 the permanent trade of water entitlements out of Pyramid–Boort accelerated above the average of previous years, as can be seen from the increased slope of the cumulative permanent trade chart in Figure B.1. Consistent selling of both temporary and permanent water has meant that, in aggregate, water reallocations through trade have moved water out of the region, and the history of permanent trading outweighed the effect of the temporary water (net) purchases in 2005–06.

**Figure B.1 Pyramid–Boort water trading, 1995–96 to 2005–06**



Sources: Goulburn–Murray Water annual reports, 1995–96 to 2005–06.



## Key drivers in irrigated agriculture

The Pyramid Hill district mainly produces wool and fat lambs on annual pastures. Dairy products, hay and some summer and winter crops are produced in the Yarrawalla, Calivil and Dingee districts. The Boort district also has a large area of annual pastures, and lucerne production has increased substantially in recent years (Goulburn–Murray Water 2006).

### Irrigation history

A series of privately owned waterworks trusts began diverting water from the Loddon River in the late 1880s and early 1890s. When these trusts failed financially the State Rivers and Water Supply Commission gradually improved water supply to the district. Importantly, the commission diverted water from the more reliable Goulburn River system, making the district less reliant on the variable flows of the Loddon River.

Water is now released from Waranga Basin into the Waranga Western Channel to supply the Pyramid Hill district, east of the Loddon River. The Boort district is supplied from the Loddon River, and additional supplies are regulated through the Waranga Western Channel to the Loddon Weir at Fernihurst. This water supplements the limited capacity of the Loddon storages and improves water quality. Pumped supplies are also drawn from the Loddon River and Serpentine Creek.

### Initial distribution of water entitlements

As an irrigation district, the Tragowel Plains differ from irrigation districts to the east of the riverine plain. In the Goulburn Valley the State Rivers and Water Supply Commission set about creating new communities to use the new irrigation water. It bought land, subdivided, supplied water and found new settlers to farm the land. Each block was allocated a legal right to enough water to irrigate the entire block—about 1 acre-foot of water per acre, equivalent to 30 centimetres of rainfall a year. On the Tragowel Plains the commission supplied water to the existing settlers.

Farm size on the Tragowel Plains had been set by the minimum subdivision area allowed for in the Selection Acts, and the Water Supply Commission supplied water to the existing settlers. But it could not supply enough water to water all the land on any given farm. So, rather than supplying a few farms with all the water they needed, the commission shared the available water between all the farms with access to its channels. It granted water rights at the rate of 1 acre-foot for every 5 acres. This was insufficient water to irrigate a whole farm. The channel system distributing the water to the larger Tragowel Plains farms was longer and more complex than the channel systems in the Goulburn Valley; it was harder to manage and the water delivered to the Tragowel farms arrived more irregularly than water in the Goulburn Valley (Barr 1999).

The difference in supply to the two areas had profound implications for the way farming developed on the Tragowel Plains (Barr 1999).

### *The legacy of the original settlement patterns*

According to Barr, farmers in the Pyramid–Boort area have a long history of investing in extra land, particularly when commodity prices are low:

*History showed improved profitability was more likely to come from buying extra land rather than improving existing land. Not everyone was able to follow this strategy. A minority able to save cash for the right time built up very large undeveloped properties irrigating extensive annual pastures. (1999, p. 20)*

The Tragowel Plains Salinity Management Plan encouraged further property amalgamations. It also encouraged the concentration of irrigation activities on the least salinised soils (described as A and B class soils) and the cessation of irrigation on the more saline soils (described as C and D class soils).

Today there are 737 irrigation services, managed as 583 businesses, which is about 150 less than seven or so years ago. The trend towards increased size reflects the trend



in agriculture in general: economies of scale and diminishing terms of trade, coupled with increased productivity, continue to promote growth in business scale (RMCG 2006).

About half the businesses in the region use over 250 megalitres of water a year, and a quarter use more than 500 megalitres. Modelling suggests that about 70 per cent of the water is used on independently viable businesses—about 30 per cent of Pyramid–Boort businesses. The remaining businesses depend on off-farm income. Dual incomes are common, and off-farm income is, quite legitimately, an important part of many farmers’ ‘portfolio’ of income streams (RMCG 2006).

### *Drought management*

As a result of a series of years of low water allocation, maintenance on the supply system has been cut back to reduce price pressure on irrigators already financially stressed by increasing costs in their businesses (RMCG 2006).

### *Institutional settings*

#### *The 2 per cent rule*

When permanent trade was introduced, the Victorian Government limited total annual permanent trade out of any irrigation district to 2 per cent of total entitlements for the district. The purpose of this ‘2 per cent rule’ was to keep the rate of change in manageable bounds and to ease revenue pressure on the water authorities.

Permanent trading of water out of Pyramid–Boort has reached the 2 per cent limit several times in the last few years, and significant trade is likely to continue for some time. There is a backlog of requests to trade out, and under the National Water Initiative the limit is being increased to 4 per cent (RMCG 2006).

### *Reconfiguration*

Victorian legislation now provides scope for irrigation districts to be ‘reconfigured’ to improve their economic efficiency. The pressure for reconfiguration is strongest when water has been transferred away from smaller spur channels and pipelines, leaving small volumes to be delivered at high cost to those remaining on the spur system.

Relative to other parts of Victoria, there is very high pressure for reconfiguration of the Pyramid–Boort region. Over 25 per cent of water originally tied to land—and therefore tied to the related supply infrastructure—in the region is now used on other properties, in or outside Pyramid–Boort. This means there is a growing mismatch between where infrastructure is and where water is needed (RMCG 2006).

Moreover, as enterprises change—for example, as more horticulture moves into the Boort area—irrigators are starting to seek different levels of service. At present there is nominally a single level of service, although some variations do exist in practice.

The Future Management Strategy that is being prepared is not based on the need for change being promoted by existing users. It assumes the following:

- Most recent developers have adequate service and security because they have invested near carriers and trunks.
- Channel capacity share and exit fees should resolve difficulties associated with the legacies of future trade.
- Projected prices for water will still not be high relative to other areas.
- Many ‘last-generation’ farmers will be comfortable with the system as it is and will simply wait out their time until selling (RMCG 2006).

And it sees the need for change as revolving around four factors:

- the need to be competitive in attracting more development and securing the finance required for this development
- avoiding the need to spend money on under-used assets
- enabling irrigators to stay abreast of technology changes and capture the services that come with that
- avoiding being left behind—becoming a living museum—and becoming uncompetitive (RMCG 2006).

### *Interim delivery shares*

‘Unbundling’ of northern Victorian water entitlements on 1 July 2007 will result in district irrigators holding delivery shares that entitle them to specified volumes being delivered per unit of time during periods of peak demand for the delivery of water. The delivery shares will also confer on irrigators the liability to keep paying for their access to the delivery system even if they sell their water.

To reflect these changes, access and delivery tariffs have been changed in advance of unbundling. This will help protect the revenue base of water authorities, act as a disincentive to permanent water trade out of districts, and allow for setting exit fees based on the present value of this revenue stream.

### *Source-tagging*

After unbundling, the ‘water shares’ being used in Sunraysia will be identified as coming from either the Goulburn system or the Murray system. Depending on the season, these different water shares might have different allocations attached to them. The prospect of this change has precipitated much recent trade out of the Goulburn system into Sunraysia. This is largely because allocations on the Murray system have been higher than those on the Goulburn in the past 10 years and, before unbundling, water traded out of the Goulburn to the Murray was assigned the higher allocation of water coming out of Murray storages. Some

of these allocations have then been traded back up the Goulburn system. This will not happen once the water shares are ‘tagged’ to the source storages.

Further, on 18 December 2006 it was announced that permanent trading rules for trades between systems will require that a seller’s allocation of water be at least equal to the allocation levels that apply in the buyer’s system for the remainder of the 2006–07 irrigation season (Goulburn–Murray Water 2006). Trade out of the Goulburn into the Murray was probably accelerated to take advantage of the difference in allocations before unbundling.

### *Industry concerns*

#### *Mixed farming*

The history of the Pyramid–Boort system is based on mixed farming, producing unassisted wool, lambs and crops. This contrasts with neighbouring irrigation settlements, which were originally based on assisted products such as dairying and processing fruit. That assistance has now largely gone, but echoes of this past are guiding the current views of many irrigators:

*The overall attitude of the rest of the community to water trade? Pretty much the same line, some would perhaps be a little more negative than me, but I think I reckon I’m probably more middle of the road. Yeah, I reckon it’s a positive thing and it’s the way to go providing it doesn’t isolate the community or get to the stage where you are shutting areas down. That is just not on. But a lot of people will argue you shouldn’t be watering pasture anyway. I’d argue you can do your studies or whatever but I can show you just as many studies—for example, the biggest profit per megalitre used two years ago was prime lambs. Beat grapes, everything else but they won’t publish that because it doesn’t fit with their scenario. The most profitable use of water two years ago was to water grass for prime lambs, not grapes, capsicums or olives or anything else. It was prime lambs but they don’t tell*

you that. And OK, it was one year, when lambs were \$140 but so was the grapes, the grapes only lasted one or two years too, so olives will be the next things, then nuts up at Robinvale. But, if you want to create a system that is sustainable and long term and going to ride the peaks and troughs, that system's got to be designed around your generic prime lambs, dairy, cropping scenarios. Otherwise you can't build a system. I don't think you can build a system around fads and fashions.

### Dairying

Dairy farmers in Pyramid–Boort send mixed messages about the future. Some are optimistic and are expanding; others report an overall decline:

*No, they are all selling up. There are very few dairy farmers left now and they are all quitting pretty quick. There was one dairy farmer, [name]; they stopped three to four years ago. There were probably six or so down on the river that have gone in the last five years. And there will be another two to three in the next couple of years down on the river. We will be one of the only dairy farms left; there is probably two on the corner that will probably shut up shop in the next five years. Say there will be four gone in three to four years and that changes the face of the community in 10 years from now. And all the jobs that go with it.*

### Processing tomatoes

The processing tomato industry is not the force it used to be around Boort. This has more to do with competition from imports than it has to do with water trading:

*This is probably the first year in 35 years that we haven't grown tomatoes. Is that because of water shortage? In hindsight, not so much because of the water issues; it's pretty fortunate we didn't grow tomatoes, very fortunate, because of imports and higher running costs, everything*

*else going up and the price is still going down. We lost 40 acres last year of 250 acres through the locusts that came through. There was a swarm that came through and wiped out 40 acres; we lost about \$300 000 just through that ... It's year-by-year contracts, and about four years ago we got our contract just sliced because of the imports, etc, and that was about 3500 tonnes. We had four other contracts at that stage—SPC, Berry and Rosella. Anyway, up until now they've just been cutting us back, cutting us back because they think it's too dear to buy our product when they can import it through China. This is where it really started. My family was one of the original families that started growing tomatoes in this area. And so that developed from there, so with Dad and his brother and then I got into it in 2000 when new contracts were really hard to get and there was no water and the drought started, so it hasn't been a good five or six years for me.*

### Managed investment schemes

As in other irrigation communities, the people of Pyramid–Boort are sceptical about the growing involvement of managed investment schemes in irrigated agriculture. They see it as the taxation system distorting the markets for land and water, and they are especially concerned about the impact it will have on river health as large volumes are moved downstream and demand is concentrated into shorter periods of the year.

Unlike Sunraysia irrigators, Pyramid–Boort irrigators do not see managed investment schemes competing with them in commodity markets. Consequently they are less concerned about the schemes flooding markets; rather, they see them as evidence of a misplaced government enthusiasm for 'high-value crops'.

In that context, local irrigators will feel vindicated if the schemes prove unprofitable. There is, however, one such scheme—the one inside the Pyramid–Boort Irrigation District—they would like to see survive for a long time yet.

## Community action

Community leaders in irrigation areas most affected by the potential for stranded assets are starting to look beyond government for salvation of the community values they prize. While still lobbying for controls on the permanent water trade, they are also introducing what they see as a safety net:

*The drought is masking things because it distorts the price of water. Under the current situation, there's no opportunity for the normal succession process to go on. Many farmers are coming to an age where they might like to pass the farm on, but suddenly their water's gone. They might have a genuine desire to sell it within the district, so something we've been doing to try and address that is this water bank concept. It will give farmers the opportunity to become irrigation farmers, by financing them into water. It's not to control water markets or anything like that, but it gives people a chance to get started in this district. It's got widespread support—community support—from milk companies, to shires, to local business.*

*We're basing ourselves on the Bendigo Bank model. There'll be three levels of investment. We're expecting that some people will make donations or buy shares. They can state whether they want an immediate return, or if they are looking more at the long term; say, 'Here's some money. Give me something back in ten years from now' or whatever. Or say, 'Yeah, I don't want a lot. Just give a moderate rate of return'. Or you can have full investors. The only difference between this water bank and a normal bank would be that the money is secured by water instead of capital. Our intention is to do something that's significant, something large enough to attract the mum-and-dad investors. We want to attract the sort of people who would say, 'I've got a hundred dollars here. I want to put it away for the kids'. Definitely there's an opportunity to give a good rate of return on that hundred dollars. A little bit more affected by droughts and floods and all those sort of things, but if you look at the average*

*rate of return, it's pretty good. For water, the average return over the last 10 years was over 8 per cent, which is better than anything else.*

One government employee cast an interesting perspective on the move to create a 'community water bank':

*I think the thing that might make it work is that it gives the people who would like to sell a going concern an opportunity to reduce the arbitrage between what they would like to do and what a 'rational' investor might do. I think a lot of people would wear a bit of a discount on realising the full value of their assets if they felt they were doing something positive for their community. It might give those people a bit of a halfway house between doing what they think is the right thing by their community and being made to look like fools by people with an eye for a bargain.*

## Irrigators' views

### Perceived benefits of water trading

Irrigators in Pyramid–Boort see benefits of water trading arising in a number of areas—business growth, capital productivity, opportunistic cropping, liquidity, cash flow and debt management, drought management, easing of channel congestion, and reduced costs for others through trade into the region.

### Business growth

Irrigators have been able to increase the size of their businesses by buying more water. This has been especially noticeable among horticultural businesses around Boort, but it is also the case for other irrigators.

Until recently, district irrigators had expanded their business by buying neighbouring properties complete with water: they did not have to enter the water market as such. Many of the irrigators interviewed said this was still their preference, but

the market dynamics are changing. People are increasingly faced with the prospect of buying a property that has been stripped of its water and then having to buy the water separately.

### Capital productivity

Water trading allows farmers to make conscious decisions about how much capital they invest in water. As one irrigator put it:

*We needed water and at the time we didn't want to expend the money required to purchase it, that's why we are leasing with an option to buy ... It's for capital management ... It was a strategy put in place to basically delay the investment over a few years, rather than do it all up front and borrow more money for it. We could do with the cash and we satisfied ourselves with the security of the arrangement.*

The trading also allows farmers to consider how much of their capital portfolio should be tied up in farming:

*I won't be buying more water at the present time, but as far as I'm concerned there I've got enough exposure to agriculture. I think I'd be better off putting it into BHP than farming. But I'll continue to utilise the surplus water either for on-farm production or if the market's available to trade it temporarily, I'll just take advantage of that—much smaller. But I've certainly got no problems utilising it mainly as a temporary seller where there is value in doing it.*

*Are there costs to the local community in terms of temporary trade? There mightn't be costs, but there are risks. People have a tendency, when something happens for four or five years in a row, they think it's a permanent feature of the world, and many of them have now based their systems on water being \$40 to \$60, and all of a sudden you get something like this, and you're out of business.*

### Opportunistic cropping

In many ways Pyramid–Boort is to Victoria what New South Wales is to the Murray–Darling Basin: it is that part of the system where water is used most opportunistically:

*I've got no problem with the fact that water should be going to higher value users. I've got no problem with the fact that pasture-based industries, like my father utilises, should at best be opportunistic things—that take advantage of water if the infrastructure is there when the water price is cheap. When there are sales allocations and so there's less demand, less competition for the resource; it's a bit like in New South Wales this year there is hardly any rice being grown ... So you've got these other agricultural uses which start soaking up extra water as it becomes available at a commercial value.*

### Liquidity

Water can be sold rapidly—with minimal advertising costs and very low transaction costs—virtually anywhere in the southern connected Murray–Darling Basin. There are willing buyers and sellers at all times. It is highly probable that the next trade will be executed at a price equal to that of the last one. Water is a very liquid asset: 'I bought an extra farm a couple of years back, which as it turns out I probably shouldn't have bought. I've got it on the market now, but until it sells really the only thing that is keeping me afloat is that the bank will keep lending me money against the value of my water'.

It is this liquidity that is changing the dynamics of consolidation in the irrigation districts. People leaving farming no longer have to rely on the comparatively thin real estate market to realise the value of their remaining assets. Nor do they have to offload their assets at fire-sale prices.

Of course, some people can only envisage selling their farm as a going concern. That puts them in the thin real estate market, which is best inhabited by those wanting



to consolidate their holdings. But it is also an invitation, for people with an eye for a bargain, to buy the property and sell the water separately.

### Cash flow management

The temporary market offers irrigators the potential to generate extra cash flow. In the current drought, with seasonal allocations being low, many mixed farmers in the Pyramid–Boort region see their returns being higher if they sell their water on the temporary market:

*You do get this stigma effect of people thinking well they are selling water off, being a farmer should be using it, that sort of the thing, without realising the financial benefits of it. If you drive down the road and see someone's wheel going and watering a crop or something and you think, 'Well, so either they haven't done their sums or they know something we don't know'. Or they got that big green crop out the back ... They got this enormous good-looking wheat crop or something and yours has died and you think, 'They've got a nice crop but is there a financial benefit to doing it?'*

Very few cash flow concerns are directly related to farm production:

*My daughters were due to go away to school. And I couldn't find the funds to send them. And I believed there was no point in ten years' time saying, 'Well now I've got the money—now you can go to school'. I sold a couple of hundred megs to put them through school. So I was a most reluctant seller ... but it was something I did for the girls at the time. It was my aim, one day, to buy it back, but that is a vision that won't be realised the way things are going.*

### Debt management

The water market offers irrigators the potential to manage their debt. But people's attitude to risk is generally asymmetric: they are prepared to gamble more recklessly in order to avoid a loss than to achieve a gain.

Some irrigators with high debt levels have found water trading useful for returning their situation to equilibrium. Others have found it part of the process that leads to the end of their part in farming. Yet others find it a release, even when they have avoided formal debt by living off their depreciation:

*In terms of selling, that's one of the things that farmers have been doing with uneconomic farming enterprises: they have zero debt and live off their depreciation. My father is a perfect example; he has more money now than at any other time in his life. The continuing capital appreciation value of water has been a godsend to that type of farmer ... That's one of these water things: you bag the blokes that sell it until it gets personal, and then you are glad you can do it.*

### Drought management

Water trading has made a big difference to the way farmers in Pyramid–Boort go about the business of drought management:

*It's also helped in years like this, a heck of a lot of people, especially the mixed farmers who can pull their head in. Some people have decided to use the small allocation—once they fill their dams and secure their house supply, depending on their stock levels and how they manage that. But there are people this year who will be selling; say, they got 23 per cent allocation they will be selling 15 per cent, probably three-quarters of that, and if they started early still price averaging at \$400–\$500 a megalitre. So to that extent they are not really losing as much as they otherwise would in a drought year like this if they weren't allowed to trade.*

### Easing channel congestion

The Pyramid–Boort delivery system is atypical of systems in most gravity irrigation districts. Rationing of channel capacity during the peak of the irrigation period has been a feature of the system in recent years. To some extent water trade has alleviated this problem:

*We have a problem here with rationing in high peak use times, we have to actually ration our system as to how much we can get at any one time. And because a lot of water has gone out of the area that actually helps my ration ... That's fairly unique to this system; it's a local thing. Never happens on the Murray system; no such thing. They had a little bit of rationing last year ... That's because their channels are bigger and shorter.*

Concerns about channel capacity can also increase the demand for water trading:

*The bloke next door is a big megalitre consumer, so he could easily buy enough megs to hold this channel and take control of his channel. In fact, I think he's come to a point where he can't get any more megalitres because he can't get it down the channel anyway; the channel's got a limit. We may be squeezed out of that in the future, we just don't know ... for probably channel capacity, that's the only thing. Because he's bought a lot of water and chopped the channel up ... He surrounds us and is putting the pressure on us because he wants his channel capacity and all this sort of stuff. He said, 'What summer crops are you going to put in this year?' (This is earlier in the season.) And he said, 'You have to be careful because I'll be taking most of it'. He grows a lot of summer crops. Yep, I admire him for the way it's going; it's probably the way a farm should be run, in the big scale.*

### Reduced costs for others through trade into the region

Pyramid–Boort is unique in that managed investment scheme developments have occurred inside the irrigation district. Their presence has reduced costs for the other district irrigators, but it is also putting some strain on the policy of maintaining a single level of service for all irrigators:

*Having Olivecorp here has kept everyone else's water bill down by about \$3 a meg.*

*Look, none of us like the idea of MISs, but if we have to have them, it is better that we have them inside the irrigation districts than outside them.*

*Horticulture in this area is an interesting one because there are differential levels of service. It's an accepted thing that tomato growers will get a higher level of service; Olivecorp last year got out-of-season watering. The season ends and everyone else had to stop irrigating but Olivecorp could keep irrigating. If you want to keep investment in the region the worst thing you can have is your single biggest water user being grumpy. But by the same token the mixed farmers don't want to put that differential level of service in writing; they accept that it happens but they don't want to put it in writing because they say, 'Well, if we document it, well they will expect and demand it'. So they are saying they are happy with the current practice. We'll cop it, but don't write it down. But that's the big thing about the reconfiguration is this idea of differential level of service. If someone is happy to pay for water on demand then maybe they'll get it.*

### Perceived costs of water trading

Irrigators in Pyramid–Boort see costs of water trading arising in a number of areas—stranded assets, competition with New South Wales and whether exit fees are attached to land or water, the non-validity of dryland farming, managing the reconfiguration, degradation of the river channel, and the build-up of pests.

## Stranded assets

As water moves out of irrigation districts, the delivery infrastructure becomes an under-used asset. These ‘stranded assets’ increase annual costs for the remaining irrigators. They were the number one concern for all Pyramid–Boort irrigators interviewed for this study:

*There are benefits to permanent trade. It allows people to realise, in the event they are selling their property, there is no doubt that the net worth of their property, the asset value of their water, has made the asset value of their property substantially higher than would otherwise be the case. And if it is in the local area, if it's a regionalised thing, then presumably it's leading to new investment in irrigated infrastructure and irrigated industry within your district ... It might be just a dairy farmer going from 200 cows to a 1000-cow dairy, new layout and rotary; he is going to be consuming more and more resources and so to that extent, if you like, it's reinvestment in irrigation infrastructure in your area. The problem is, though, if it's going outside your area ... I suppose that's where the costs basically are. The impact on the remaining irrigator base is the main cost as I see it.*

Some irrigators are philosophical about what has happened so far but fearful about the future:

*Permanent trade? I think there have been big winners, it's hard to know. Look, it has certainly given farmers big cash to get out if you like. We haven't had it, but for a lot of people they have worked all their life and all of a sudden they have something to sell which probably wasn't there ten years ago. But on the other hand I think a lot of the corporates and those guys are winners as well. Up until this stage, unless we start getting a bit of a meltdown within the area, I think there's probably not a lot of losers. However, if it gets to the stage where that much water goes out that we are unsustainable, then there are huge costs, huge ramifications.*

Most of the irrigators interviewed were strongly opposed in principle to the concept of permanent water trading. They saw this as the greatest threat to the future of their district. Most were, however, very supportive of the principle and practice of temporary trading: ‘Permanent water trade is wrong, plain wrong. It is going to ruin this district and for no other reason than to satisfy a government fad. It is going to bugger up this community and it's going to bugger up the river. They could have had all of the benefits of trade and none of the down side if they'd just stuck with temporary trade’.

## Competition with New South Wales and attaching exit fees to land or water

Pyramid–Boort farmers are particularly mindful of their competitive position vis-à-vis what they see as comparable districts in New South Wales:

*The Victorian Government have been really good in their approach, with the exception that they put themselves up as the gurus—‘We are the leaders in water reform’ and we are not. Every other state is sitting back laughing at us: you go for your life Victoria, you sell us all your water, you do all this, you get rid of your water ... New South Wales just sits back and lets Victoria get everything right and make all the mistakes and they will move in when they have to.*

The farmers are conscious that New South Wales irrigation companies are seeking to have their exit fees set high and for the fees to be attached to the water, not the land. They see this having a profound influence on whether or not the Pyramid–Boort system will survive:

*When you look at it in respect to what's happening with interstate trade as far as I am aware, Murray Irrigation is still being allowed to keep their \$495 a meg exit fee, and it's on the water, it's not on the land. With an active transfer rate of about 0.6 megs from Murray Irrigation to 1 meg in Victoria, their exit fee is equivalent to about*

\$700–800 a meg. Victoria, the last I heard, they are talking about nothing higher than \$300 a meg if it's brought in. And it's attached to the land. How competitive is it to attach it to the land because then if the farmer doesn't buy up the exit fee he's got this rating of \$25 a meg attached to his land, even if it's a dryland farm? So the who the hell is he going to sell his farm to? He will essentially have to, once it's been in place for a while, what's going to happen is the whole structural collapse of this district within five years because it's totally unsustainable in a district where the water is continually traded out ... So what that means is that those guys are continually going to come into my area in preference to New South Wales unless that standardisation occurs. In about five to 10 years' time New South Wales might be forced into line with Victoria—and in the meantime all the water that is going to be bought by developers will come from here because it's too dear over there.

Partly because they are aware of what 'the competition' is doing in New South Wales—but partly, too, because they worry about the future viability of their farms as either dryland or irrigation—many irrigators interviewed were not happy with the tariff changes designed to reduce the risk of stranded assets:

*I just think it is too little too late. It might have worked if it had been in place from the word go, but now it just reduces the options you've got for using the land. It puts a tax on the land. It actually makes it harder to work out the best thing to do because you are locked into servicing that bit of land when the bigger job is thinking about how things should be in the future.*

One irrigator summed up the view expressed by many—that attaching the ongoing fees to water rather than land would better protect Goulburn–Murray Water's revenue base:

*The only way they can do it is to actually have a cap, and I don't know whether that cap involves a cap within the Pyramid area and each of the other five GMW districts*

*such that the water movement cannot be any more than that. Alternatively, it's a cap across the whole GMW zone so we might go back to the olden days where there was one water rate across the whole district. They can still go along with their infrastructure restructuring as a management strategy perhaps because in the private sector asset restructure goes on year on year and it's only a big deal if you are in the public sector and haven't thought of it in the past because you are bloody made of stone ... The whole issue revolves around revenue base and the fact that unless they come up with an exit fee, maintain infrastructure access fees, that's how they are looking at protecting the revenue base of the area because the revenue base is determined at the present time by the megalitres of water delivered to the area. It's essentially the main driver for revenue base and as this water is lost what that means is that unless those come into place, revenue base, these systems are predominantly overhead based in running costs. There are not too many variable costs. Things like automation, reconfiguration, all they are doing is basically in the short to medium term, all they are doing is reducing the pressure on the balance sheet, but it is taking materials off their balance sheet, therefore reducing infrastructure maintenance costs and therefore on that particular component of the price.*

### *Dryland farming: not an alternative*

Irrigation farmers in Pyramid–Boort believe that, if the irrigation system is not maintained in its present condition, dryland farming is not a viable alternative:

*There are two distinct soil types: one you can farm dryland, one you can't. Well, this side on the heavier black soils you can't dryland farm; you need water. On the other side of the system the redder country you can farm dryland, no worries; it's just the heaviness of it. There has been plenty of country de-watered through here and it's basically useless now. You can't farm it unless you have an exceptionally wet year, which we don't get very often*

any more. They are just not viable the way they have been left without water. And there is starting to become more and more of it.

*If this area here lost all its permanent water, this place would be vacant because this area—this strip through here—really needs water. You can't farm as dryland, so if permanent water went off here it would be just a desert, and you lose all the infrastructure around you, too.*

*If this area became dryland it would need huge amounts of consolidation because the economic size of farms around here in a dryland situation—if you use the Powlett Plains as an example—is probably about 4000 or 5000 acres. The average landholding here is about 500 or 600 acres.*

## Managing reconfiguration

Uncertainty was the prevailing mood among the irrigators interviewed. Although involved in Goulburn–Murray Water's efforts to think through reconfiguration, one irrigator contrasted that with his long involvement with the Tragowel Plains Salinity Management Plan: 'When we were working on the Salinity Management Plan it became really clear what we had to do next. It opened our eyes to how to get the best out of our land. It gave us certainty. This reconfiguration stuff does the opposite: it makes it really hard to decide on the next thing to do on your own farm'.

Farmers are also extremely conscious that what their neighbours do will have a profound effect on the continued viability of their own businesses—especially as Goulburn–Murray Water rethinks the future viability of its infrastructure:

*I'm in a situation where I am at the north end of one of these pod-type operations where I'm at higher risk of stranded asset type of arrangement than someone who's just on the trunk channel, further south. And I'm in a situation where I've got to spend another \$50 000, and whether I do it out of cash or borrowing some, now I have*

*a bit more capacity to do this than others in the district. But why would I? And I don't know if you have spoken to a bloke at the very end of my channel; he used to have a big family partnership, he just bought his brother out, he is probably paying a [considerable sum] of money for water and hay at the moment. He is going to have a couple of million dollars of debt after this. So if we have another couple of bad years he might just say, 'I've had enough', give it the flick and walk away with a couple of million in the pocket. In that situation they are the things I have to talk about before I go re-investing. And that fellow is in a worse situation because he probably has a million-dollar dairy, all this pasture development, and some of it might have been written off for tax purposes, but from an asset perspective replacement value, he's probably sitting on, aside from his water, \$3 to \$4 million worth of asset. And he will never sell that as a dairy probably. So, if he wants to go and reinvest in it or double his herd and he's already very frustrated about water delivery of the system, what's he going to do?*

Many irrigators were also critical of what they see as retrofitting a rational rating system onto an infrastructure system that was not designed with economic efficiency in mind. One irrigator drew attention to what many see as the unfair result of recent changes to tariff charges:

*GMW has started to put a service charge on every outlet. It's fair enough in a way, except that they have been running it as basically a socialised system for the best part of a century, where everyone pays a flat amount for water. I've got a very big water holding and I'm lucky I get all my water through just three wheels. A good friend of mine over the way has five times as much water as me, and he's got something like 50 or 60 wheels. It's no fault of his it's just the lay of the land. He's made all his investment decisions based on the water charges of the past. Now, at \$200-odd a wheel, his bill is going to go up and mine is going to come down.*



Irrigators are conscious that if there were to be 'postage stamp pricing' then, no matter how the lines are drawn, 50 per cent of outlets will be above average and 50 per cent will be below average in terms of cost-effectiveness.

Given these tensions, irrigators were very critical of Goulburn–Murray Water's mooted investment in improved metering systems to help bring about water savings. One irrigator summarised it: 'It just doesn't make sense to me. For one thing it is a pea-and-thimble trick: it's not actually going to save any water. But the main thing is this: why on earth would you spend an extra \$1500 on every outlet when you're trying to rationalise your assets in the first place?'

### *Degradation of the river channel*

The Barmah Choke limits the amount of water that can be delivered within a given period to irrigators on the Murray below the Barmah–Millewa Forest. The demand for new developments is mostly below the Choke. The Torrumbarry system, which is below the Choke on the Murray, is therefore a source of water to be traded. Water from the Goulburn River, which services Pyramid–Boort, is also increasingly being traded into the Murray. Irrigators in Pyramid–Boort noted the potential environmental impacts of this trend in order to highlight their concerns about water trading:

*All the development is taking place in a little zone between Swan Hill and Hattah. And what would happen if, say, half Goulburn–Murray Water's water—let's say 600 000–700 000 megalitres—were allowed to go down the river. Suddenly what you've got is all that water has got to go down in a 120- to 140-day period because nearly all the water is used in that three months. And then you've got this increased pressure, and at that stage the Murray is going to be really stuffed really quickly—not to mention the fact that they've have rooted the [Goulburn–Murray Irrigation District].*

*There is no rule that says the land that was originally developed for irrigation 100 years ago is the most appropriate land for more development now. And the set of circumstances have changed, so I've got no particular problem with that. I just don't think the change should be laissez-faire ... It's not about capital. The approach up to now is that basically it's capital. Well, bloody pump it uphill if we can; you can take it anywhere you like. It's not capital, it's a natural resource and it should be utilised where it is sustainably available, and in a lot of cases that doesn't necessarily relate to the fact that I'm at Pyramid and I'm a redneck and don't you bastards take the water away from Pyramid. There are also sound environmental reasons ... I didn't invent the Living Murray, [but] why don't you comply with it? I didn't write the Murray–Darling Basin Agreement clauses 46 and 47, which say that the states aren't allowed to increase flows in the Murray without consulting the Murray–Darling Basin Commission.*

### *The build-up of pest plants and animals*

Agricultural land that is being managed neither for irrigation nor for dryland farming has a higher incidence of pest plants and animals. This increases the inoculum potential for neighbouring properties.

### *Cognitive dissonance in the irrigation community*

Cognitive dissonance is the uncomfortable tension that comes from holding two conflicting thoughts at the same time. The theory of cognitive dissonance sees those contradictory thoughts serving as a force that compels the mind to acquire or invent new thoughts or beliefs or to modify existing beliefs, so as to reduce the amount of dissonance (conflict) between attitudes, emotions, beliefs or behaviours. In the extreme, people's mental health can depend on their being able to reduce the conflict between those different thoughts.

### *Certain about the future potential of their enterprise but uncertain about the future of the district*

Many irrigators in Pyramid–Boort are prospering. Some of them are doing so in inconvenient parts of a delivery system that is being subjected to much scrutiny in relation to its efficiency and cost-effectiveness. One Goulburn–Murray Water employee gave an example: ‘There’s one big farmer; everyone around him has just about disappeared and he is right up the very end of the system, but he’s got a heap of water. So we have to put 18 megs down the system so he can take 10 megs, so he’s where we’re getting big losses but he’s also a massive customer’.

Farmers contemplating major on-farm investment must take account of the potential outcomes of reconfiguration:

*When we built the rotary we were positive for the future. You don’t spend three-quarters of a million dollars just on hope. But, given there are some limitations, the decision we had to make—whether we build it or not—wasn’t about the economics of it; it was about the viability of the area. That was the decision we had to make: In 20 years is that channel going to still have water in it? The decision wasn’t: Is our business capable of financing it or capable of growing fast enough to sustain it? The decision was: Are we going to be here in 15 years as a community? And are we going to be here as an irrigation district? That’s the decision we had to gamble on ... And it’s very hard for the shire, or anybody, to attract development and new business with this hanging over our heads: Are we going to be here in 10 years’ time? ... OK, the government can come out and say, ‘We are not going to shut anyone down’, but everyone knows that in reality, if the pendulum swings far enough, one day they will say, ‘Righto’ and change their minds.*

Farmers have investment cycles, and ideally reconfiguration timetables should take account of these. One farmer who is involved in the reconfiguration process described his dilemma in these terms:

*Look, I’ve got my own investment decisions to make. There are investment cycles on my farm, just like there are investment cycles for Goulburn–Murray Water. If I am growing lucerne I need to plough it up every five to 10 years and think about the irrigation layout at the same time. I know exactly what I would do if I only had to worry about the farm. The trouble is I have no bloody certainty about whether GMW is going to invest in the upkeep—let alone the improvement—of the infrastructure to get water to my farm. If they don’t, I’ll quite likely lose a lot of money on what I’m sure would otherwise be a good investment.*


Another irrigator thought more recognition of these on-farm cycles should be built into the reconfiguration process:

*I’ve got no problem with the fact that water trade should occur. I just think, because of the fact that we are starting from a socialist-based system, there should be more rules and regulation with respect to protecting the business interests of the people who are continuing to farm profitably. If you are going to shut things down, do it in timing with our business cycles.*

### *Wanting to farm but knowing there is more money to be made trading water*

People like to be busy. It is sometimes hard to sit still, even if that is demonstrably the best option:

*The thing is, even with this water trading, all this depends on the age of people. The old boys, you talk to them around here, and there’s a lot of probably over-60 farmers right round me, I’m the only one under 40 or 45. And all those blokes just do the same old thing if they got 25 megs or 200 megs: they just tip it out. It’s just what they’ve done all their life—like my old man; I had to really nut him down. I can’t make any money out of growing wheat with water; we only pay \$35 a meg for it but if we sold it on the open market we’d get \$400–\$600 for it. We can’t make money putting it out on our lucerne or our wheat crops because you still have to get the crops off. And it*



*took me probably three years for Dad to start seeing that. Whereas these other old blokes they haven't got the young blokes on their farm, so they are stuck in this mentality of doing the same thing every year because that's what they have always done. The bottom line doesn't really come into it. If they've got some crop to strip at the end they are bloody happy because that's their life. They love getting out on the old machines.*

### *Wanting to expand **and** maintain the community*

Many of the irrigators interviewed have conflicting emotions about the depopulation of rural areas. They speak with a sense of loss about the demise of the local footy club or the dwindling numbers at the local school, but in the next breath they speak, with justifiable pride, about the way they have survived in farming and how they have managed to build up their holding of land and water by buying out other farmers. Some even speak of their ambition to buy more farms.

### *Empathy for those in trouble but disdain for those who do not sell a 'going concern'*

Irrigators are reconciled to the continuing amalgamation of properties. They know this means fewer farmers and thus fewer people in the area and fewer children in the schools. Accordingly, irrigation communities rail against what they see to be the underlying reasons for people feeling they need to sell, but at the same time they have much sympathy for community members who can no longer continue farming. There but for Fortune go we.

Property amalgamation is a familiar, if somewhat discomfiting, part of the farming scene. The exit is mourned, and the purchase is made as dignified as possible.

The change is understood to be an opportunity for neighbours as much as a loss for the community. No one can begrudge the purchaser their gain. Rather, there is almost a sense of noble obligation surrounding the purchase: someone must keep up the good fight.

Separating the sale of land and water changes this dynamic. It opens the possibility that the vendor will, in effect, cause irrigation to cease on that property. This, in turn, will bring about a net reduction in irrigation in the local area.

In all districts social norms have emerged to guard against this. But at the same time there is also a 'game of chicken' going on. Most do not want to sell, but if things start going that way they do not want to be the last to sell because that would probably mean selling at a discount.

In Pyramid–Boort the spectre of reconfiguration has converted this underlying tension into a 'prisoner's dilemma'. In game theory, the prisoner's dilemma is a game in which a player can 'cooperate' with or betray the other player. Each player's sole concern is maximising their own benefit—without having any regard to the other player's outcome. The two prisoners are arrested, are placed in separate cells, and are unable to communicate with each other. Each is given the same proposition: 'If you confess and your opponent says nothing, I'll drop your charges and make sure that your opponent gets 10 years. If your opponent confesses and you remain silent, they'll go free and you'll get 10 years. If you both confess you'll both get two years. If you both remain silent, you'll both get six months'.

The dilemma is that, in equilibrium, rational choice leads each player to choose to defect (betray), even though both would be better off by cooperating. The game illustrates the conflict between individual and group rationality. A group whose members pursue individual self-interest can all end up worse off than a group whose members appear to act contrary to their individual rational self-interest.

In the real world of Pyramid–Boort, those irrigators that remain after each permanent water sale understand the attraction of 'defecting', but they put pressure on each other to 'cooperate'. There are opportunities to punish non-cooperative acts:

*We had a couple on the Water Service Committee that traded—permanently traded—their water. And at the*

*next election they were booted off. So I think there's a measure of what the community thought. And not only that, but the community then got concerned because they thought, 'Heck, here's two of our representatives on the Water Service Committee. They've permanently traded their water. What do they know that we don't know?'*

The subtlety and sophistication of the dilemma are not well understood by the nearby townsfolk. They are affected by the ultimate decisions, but they are free of the burden of continuously weighing up the pros and cons of defecting or cooperating.

### *Wanting to sell a going concern but mindful that the buyer might separate water and land*

The prisoner's dilemma comes to the fore whenever a Pyramid–Boort irrigator is confronted with the decision to sell. One irrigator described the difficult thought processes involved:

*There is a property over the channel that a mate of mine actually bought. Anyway he bought the water with the land, sold the water to the olives, and then about a year later sold the property. And now that place is just vacant. I agree that that shouldn't really happen ... but then it depends on the property. Like, you get some salty ground, the water should be taken off. If we sold our property with the water on it, and we get x amount but then a mate buys it and sells the water off it and gets as much as what he bought the property for, and he walks away and then sells the property. Then we're thinking we did the right thing by selling the water with it, but old mate doesn't care and he made bloody \$100 000 more. So we think we are doing a service by keeping it all together, but people just don't care. But it's not right to sell it separate, it's probably right to keep it together but people don't do it. It depends on the ground. People are going to do it, though.*

## Community views in Pyramid Hill

Pyramid Hill is a small township situated at the foot of a hill that is almost an exact triangular pyramid of granite. The town lies 40 kilometres east of Boort, 84 kilometres north of Bendigo, 50 kilometres south of Kerang and 252 kilometres north of Melbourne. It is in Loddon Shire and is administered through the shire office in Wedderburn, which is 72 kilometres away. The 2001 census found the population of Pyramid Hill to be 492 people; it is now estimated to be around 400 people.

After an initial general description, this chapter presents the findings of interviews conducted with a cross-section of Pyramid Hill residents.

### Economic profile

Pyramid Hill is surrounded by the Tragowel Plains, which support mixed dryland cropping, beef and sheep grazing, and irrigation enterprises, particularly dairying. Average annual rainfall is 350 millimetres, producing in dryland cereal crops yields of about 2.5 tonnes a hectare and 1.3 tonnes a hectare for canola and peas. Irrigated areas also produce wheat, barley, triticale, canola and maize, with higher, consistent yields averaging about 4.5 tonnes a hectare for cereals, 2.5 tonnes a hectare for canola, and 10 tonnes a hectare for maize. Among the new crops to the area are walnuts, cherries, apples, pumpkins, watermelon, potatoes, peppermint and forestry (Pyramid Hill 2006).

Farmers in the region were some of the first to successfully manage their operations within the constraints of a saline water table that was rising. The Pyramid Salt Company has dealt with the salinity problem by producing high-quality salt and in the process reclaiming farmland in the surrounding area. A million litres of bore water are pumped each day into a series of 13 solar evaporation ponds in which the salt crystallises. This salt is then harvested, purified, dried, sifted and bagged. A profitable sideline is the production of brine

shrimp, which are grown in heated tanks and sold to the aquarium industry and fish farms (Pyramidsalt 2006). Other industries in Pyramid Hill are Pyramid Quarries, a pet-food company and an abattoir. Rural supplies, mechanical repairs, small machinery, hay baling, laser levelling, excavating and cartage businesses support the local primary producers.

## Community services

The Pyramid Hill community has a preschool, a primary school and a secondary college. There is a neighbourhood house, a golf club and a swimming pool, as well as several sporting clubs. The four churches are managed by lay people and supported by clergy from neighbouring towns. Rail and road access to Melbourne is good, and there is a community bus.

Service provision is very limited in the community. There are no banks—only agency services. Community health services are available, but there is no doctor or hospital. There was a hospital and a full-time doctor, but these have been replaced by district nursing available five days a week and a doctor who visits for one-and-a-half days a week. The hospital has become a modern aged care facility, which allows older residents to remain in their community.

One of the service providers interviewed said the community had adapted well to the reduction in services, which had the potential to have a significant social impact. In the absence of an ambulance service, the community has formed an emergency response team; the members are volunteers who have received basic first aid training and are rostered to respond to any emergency that arises. They have a vehicle equipped for emergencies. The older people in the community now feel more secure. The community has access to a range of counselling services and programs to support local farm families.

The service provider maintained that, compared with city areas, health services in the country are quite good: there are no waiting lists; district nurses can attend five times a week if necessary; and nurses have flexibility because there are fewer patients. People do acknowledge that they would not receive that level of nursing care in the city. If things are bad enough, people can get in to see a doctor. Accommodation and travel can be arranged for people who must travel in order to receive specialist care.

## Community profile

Figure B.2 summarises the community profile of the Loddon North Statistical Local Area.

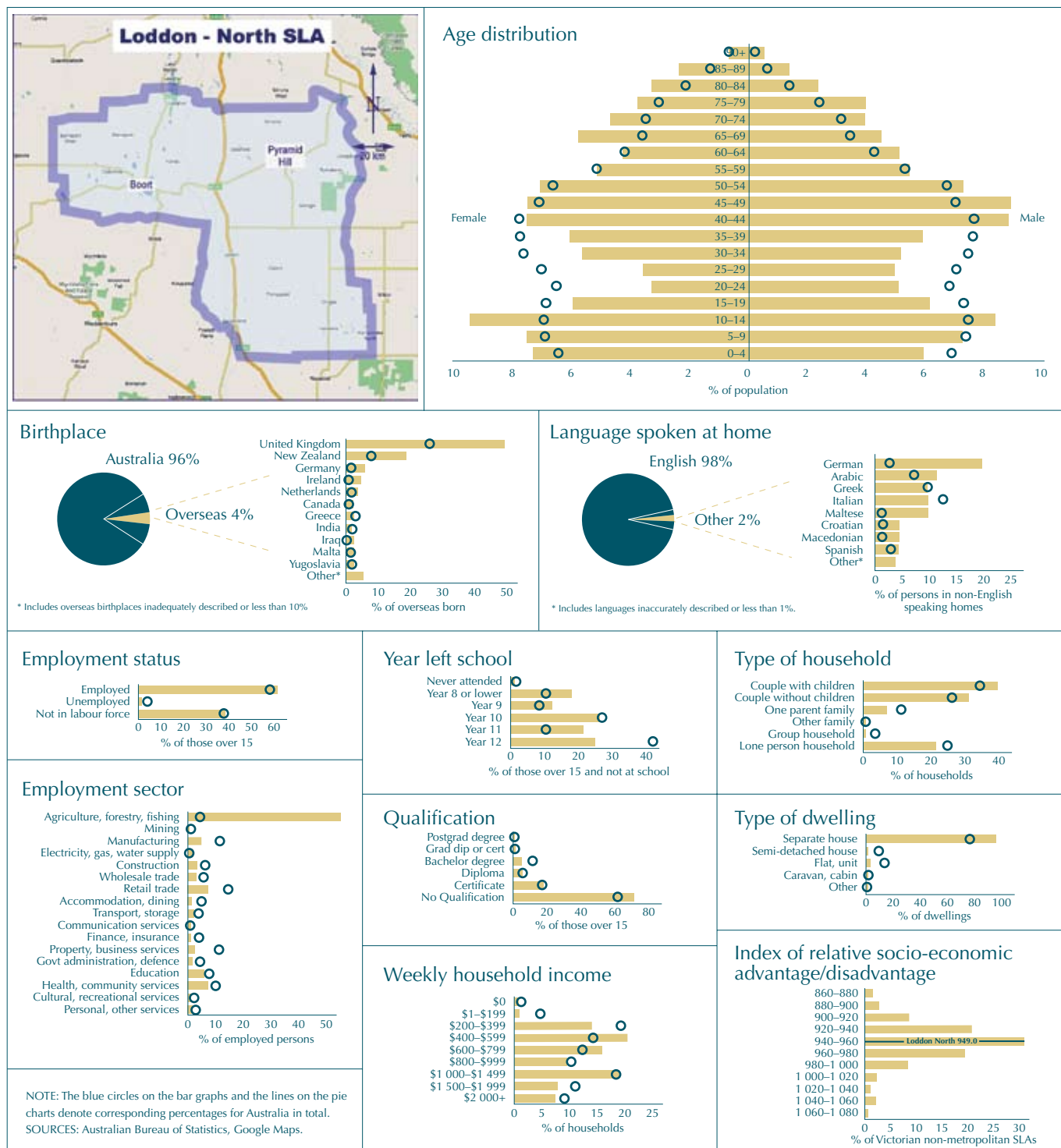
## Community strengths

When asked what were the best things about Pyramid Hill, project participants focused on the friendliness of the people, their tenacity, and their strong commitment to the community. One participant said, 'It's the climate and the friendly people—it's a very good community. We can do what we like. There is a lot of freedom'. Another responded:

*It's a good community—probably because I'm involved in a lot of things in town and my husband is involved in even more. When we had to raise \$8000 this year to cover the wages of preschool staff because the government won't give money, the whole community helps. When we go to build a new hall or do something else, everyone gets in and helps. This Friday night we are holding a street event for Christmas to launch a community bus. The Lions [Club] will run a talent quest. We have a community response team because we don't have an ambulance. They are going to take over the scout hall. People were just giving them a donation to fix up the scout hall. People are just great.*



Figure B.2 London North Statistical Local Area: community profile



## Community cohesion

Pyramid's core community is a traditional, conservative rural community of farming families and town residents who are predominantly elderly retired people, often from farms in the region. No Indigenous Australians live in Pyramid Hill. Although participants stressed the strength and dedication of the community, it was evident that these characteristics are confined to only one section of the community. Labour requirements for the town's factories have seen an influx of workers from outside the community, many of these people having come from other countries. Some live in the town, but many are transient, travelling daily from elsewhere. They form a sizeable 'other' group in the community.

One participant explained, 'The community is a mixture of working-class and farming families. There are a number of labour-intensive industries—abattoirs, pet-food factory and salt works—and the workers have a strong working-class background'. Another observed, 'There are different communities within the whole. Pyramid has got 20 or 30 families that are the core of the place and they are the ones who are out there involved in things. There is another welfare-dependent community that tend to keep to themselves and don't contribute to the town'. The core community was, however, celebrated as a caring, united group. One woman spoke of the overwhelming support she and her partner had received from the community when they faced a crisis: 'Growing up here was hard because everyone knows everyone else, but they are the first people to help'.

A nurse described how her farm family had bought the neighbouring farm in order to extend their operation. The owner of the farm they bought was an 85-year-old and wanted to continue living in the farmhouse. But the property was 50 kilometres from Kerang and the only 'meals on wheels' provided were frozen meals, and he had no microwave oven. So the nurse and other neighbours provided the support he needed. She said the shire is very supportive of the community, despite limited resources, and raises funds

for a community meal that is held weekly in one of the community halls in the district to provide a social outing and sustain community connectedness. Two cars travel from Pyramid Hill each week.

The local Progress Association was cited as an example of community pride in the town. The shire representative observed:

*In Pyramid Hill there are some people who are very passionate about that community; they are small in number and probably not sufficiently sophisticated in their community processes to build community support behind them. Nevertheless, there is a traders group that is very passionate about their town and want it to prosper and be a nice place to live and put a lot of their own personal time and energy into pursuing that.*

A Progress Association member supported this: 'Our development committee has members in their 30s and we are in our 50s. So we feel we are a bit lucky because we have some young people who are willing to learn. They are the ones driving the basketball and other things, and that's a big thing in a small community'.

## Community problems

Several residents described the loss of water in the district as 'a challenge that affects everyone'. One added, 'Water is life. No water, no production. I'm very concerned that water is leaving this district. This is an important town but the businesses are struggling. Medical services are not as good as they used to be'.

The local shire representative said population loss was the main challenge:

*The Mallee towns of Sea Lake, Manangatang have emptied out of people. Towns that were thriving 30 years ago have now lost their policeman, their doctor, and may have one student in Year 12. It's not really viable to*

*maintain those services. We don't want it to happening to our towns, and we see the depopulation of rural Victoria progressing south—and as a municipality it's our objective to arrest this.*

Employment for young people in the district was limited to the pet-food factory, the quarry or the abattoir. There are few opportunities for apprenticeships, and few young people remain in farming.

Another problem is the lack of housing:

*The greatest challenge is housing. It's a huge problem. Most of the labour for the pet food company and the abattoir is imported from Bendigo, Kerang and Wedderburn. The abattoir is actually bringing in people from overseas, from South America, New Zealand, to work there. Allied to that is the difficulty of getting professional people to live in the community due to the size of the town and very poor housing stock.*

The lack of accommodation in the community is one of the reasons workers travel in from other towns, something that is costly for them and also for the town because they do not spend money locally. A few have relocated to Pyramid Hill. Since many of these workers are immigrants or people of lower socio-economic status, they come with support needs. There have been problems with violence, which has caused anxiety among many of the older people in the community. One resident explained:

*The only thing wrong with our community is that we have a pet food factory and an abattoir that brings a lot of itinerant workers who are not interested in the community. So we have to carry them. Every community has that: you have to carry some people. The biggest challenge is that governments are putting more and more responsibility on communities. You have to get things done in your community and it's hard work.*


## The impacts of water trading on the farming community

The Pyramid Hill district has witnessed considerable movement of water out of the district. One project participant provided an overview of the status of the local industry:

*Pyramid Hill has its roots in agriculture. Irrigation came earlier than Boort. The soil types are less fertile. They are heavier clays and it has suffered more from rising water tables and associated salinity than Boort has. There is certainly some country that should never have been irrigated. And a lot of that is no longer irrigated, and that's something that water trading has allowed to happen. Growing not much more than irrigated barley grass to fatten lambs is not a sustainable use of irrigation water. The loss of water from the Pyramid–Boort irrigation area is a significant challenge for both towns. And that's a loss of water brought about by water trading. In one way, the agriculture sector in Pyramid Hill has benefited greatly from the spell of dry years because it's reduced the water table in the Pyramid Hill area. I have to say that the country has never looked better. But last year and this year have been the crunch because water allocation has been reduced drastically. It's got to the point where the dry years aren't helping the community.*

He added:

*In a lot of these towns their fortune swings and turns on the agriculture sector around them, and they are in a bit of strife at present. There is a lot of dairying around Pyramid Hill, and in my view that is the industry most exposed to this drought. Dryland farmers are used to going through tough years with no rain and no water. Cropping irrigation farmers are similarly used to it and more geared to tough times. Dairy farmers have had regular income streams until recently and usually carry much higher debt exposure, to the point where some will borrow up to 90 per cent of next year's milk cheque.*



*There is not going to be a milk cheque next year. I think they are the least prepared financially for what we are going through. I think this sector will show the first signs of distress from this drought. We are already seeing it. There are some very good dairy farmers out there, but some of them have folded up.*

Local farmers also provided their observations. One was proud of the farmers' achievements in overcoming salinity:

*There is no question that salinity has been huge factor impacting on this community. This has been the big success story of this community. Twenty years ago it would have been written off as a saline wasteland. But the community, with the assistance of government, has this land-clearing project and salinity is no longer an issue here. People know how to manage it. It's been a big turnaround. It just shows what people can do. We now have to lever off the back of that success to get the irrigation system reconfigured.*

Another farmer, with a 3800-hectare property producing dryland crops, irrigated lucerne, sheep and stud animals, had elected to ride out the dry times by putting in a feedlot and buying grain to sustain the stud breeding stock. Water is now used just for stock and not for pasture. She said:

*I tell my husband, 'Don't feel you have to stay'. We have always considered the farm to be a business. We aren't focused on the kids taking over. But we are committed to the area and involved in the community, so we are committed to making it work. But we can get up and go if we want to. I feel sorry for those farmers who are close to retiring. They are stuck, and I understand why they sell their water. Some stay on their blocks and some move in with their families.*

When asked about drought-assistance packages, she commented:

*The viability of a farm needs to be assessed. We are just treading water. We don't get any assistance. We put in this feedlot a year ago and there are subsidies for feedlots,*

*but we are not eligible. It's frustrating. It seems those who are progressive and good managers are not supported. Those who are not viable put their hand out and get it. In the long run they will survive. Some people need to be made aware there is a life after farming. If a farm is viable, they should be given some support.*

## Perceptions of water trading

### *The benefits*

One of the local farmers offered a positive perspective on the costs and benefits of water trading: 'There are big farms in this area, with a lot of land laid out for irrigation. The ability to bring water in when the price is right—and especially in autumn when the price of water is lower and use that to start winter crops—is a huge advantage'.

Another participant agreed:

*The benefits of permanent trade for farmers are the ability to reduce some debt and retire from farming with dignity. The fact is that water rights have given farmers a source of superannuation that they wouldn't have otherwise had if there hadn't been water trade. There have been some environmental benefits. Water has left land that is the least desirable for irrigation, and that has reduced problems with the rising water table and meant that irrigation is conducted on better class lands now by people who really value the water they receive.*

### *The costs*

One longstanding member of the community, a retired dairy farmer, echoed the fear of many residents that water would be taken from the community. He argued for uniform development, as it had been in the past, rather than having communities such as that of Pyramid Hill left desolate.

A member of a large farm family noted that many farmers in the area are against the sale of permanent water:

*It is against their principles and values, but they need the money and do what they have to. The crops are in, but they are really only good for hay. The water trade is a better option. Business is business. But when the water is gone it devalues the land. The properties look awful, terrible; it is not attractive aesthetically and productivity wise. People might buy the land but they can't afford the water. It's a snowball effect. So trade is OK for short-term finance but not for the long term.*

There was talk of profiteering: 'One fellow bought 20 farms and sold all the water from them. Those farms are overstocked, blowing dust; he hasn't hired anybody. It's a disaster'.

Another participant was concerned about stranded assets: 'The costs fall hardest on the community as a whole as services retreat. Also on irrigators as there are stranded assets, and the cost of managing those assets increases'. He was, however, able to conclude objectively:

*If you look at it from the point of view of a small community then the costs outweigh the benefits. But if you look at it from a macro perspective the answer is different. The fact of the matter is it might ruin this community, but where the water goes that community will be strengthened. Any discussion about water trade has to look at the difference between the micro and the macro. Water trading is all about price and pricing signals, and water is always going to move to highest value and higher value goods [and] the community is better off than if it was produced locally. That's the macro-economic argument but one that must be born in mind.*

## The impacts of water trading on the non-farming community

### *The associated industry perspective*

One business that received 60 per cent of its income from local agricultural operations reported that the business had fluctuated in the last few years. There were good returns in

2003. Water trading had had an impact on the business because where there were five farm families now there is one. Local industries—the abattoir and pet-food factory—were providing enough work to sustain them. In the past six months, though, business had been very slow: 'Normally we are flat out at this time of the year. But there are no crops. Still, we are better off than the Mallee area'.

A company owner noted that since 2003 farmers had reduced their spending, and 2005 had been a very quiet year. Even if farmers were able to produce a crop, the prices received were down. At the time the business was stable.

A contractor reported:

*Ninety-five per cent of our business is farms, but the number of farms has halved. We cover a big area, from Cohuna to Boort and right down to Dingee, because there is no other service around. The East Loddon School has lost 80 children over the last two years with dairy farmers moving away. With deregulation and farmers buying out their neighbours, dairy farmers and share farmers have gone. We are worried about a company that looks like they are cutting back. We've done their maintenance for 25 years, but as things break down they are not fixing them. The olives at Boort have been really good for our business. The town is missing the farmers that were there because these people don't use the same supplies as the farmers did.*

Asked what were the greatest risks for the business, she responded:

*Farmers having no money and can't pay their bills. It's hard not being able to do what they want done. The [power company] has just been around and some of the farmers have just been hit with fairly big defects. We had one farmer who had a major job and he just didn't have the money. And he is one of the bigger dairy farmers. We worked with the power company to see if we could do the least we can. I think we got the price down to about a third and he is paying it off. It puts pressure*



on everyone. It puts pressure on him because he has to do it. We have pressure because we have to pay suppliers. We have to say we might be a bit slow this month because we are waiting on this other fellow to pay.

The owner of one of the larger businesses in town had recently placed the business on the market:

*Years ago, I probably traded 50–50 with dairy farming and dryland beef and local businesses, and it would lucky to be 15 per cent of dairy now, largely due to deregulation and farms downsizing. But the biggest influence is water. People have just sold water and got off the farm. Most of the dairy farmers that have sold have either stayed on the farm and are dryland farming or they are selling and moving to other areas, and along with that goes their share farmer and workers. So far, business is stable. After Christmas it might change. If the conditions are the same we will be reducing staff. It's hard to keep positive.*

### *The central business area*

When asked how water trading had affected the Pyramid Hill central business area, the shire representative observed:

*Pyramid Hill has two or three substantial factors that influence it. To draw a picture of what Pyramid Hill will look like in 10 years is hard. It's very dependent on the pet-food factory: there is substantial employment there. It's reasonably reliant on the abattoir, although that's generally a transient workforce. It has opened and closed at times, and Pyramid Hill pushes on regardless. The pet-food factory has recently undergone a large upgrade. That's gives us a bit of confidence that there is a future for the factory ... Pyramid Hill supports the agricultural sector around it but the number of people living in the agricultural sector is reducing, and I can see that continuing in the next few years. So, unless there is an injection of people from a different source, the town is going to lose population. The housing stock is probably not likely to attract active people into the community.*

*Houses are coming on the market and staying on the market a long time. No one is buying in Pyramid Hill.*

The owner of a local business was finding it difficult to compete when people were shopping out of the town because, he believed, they preferred cheaper prices over quality. His business was down because there were fewer people in the district, and those remaining had little to spend: 'If the farmers get no money we don't get money. It's difficult because people expect credit'. He also noted that many people working in the town were transient and rarely spent money in the community. He said the neighbouring town of Leitchfield had lost several businesses, including a cheese factory, whereas Pyramid Hill had remained fairly stable despite turnover having stagnated. He remained optimistic, though: 'I'll play it by ear for the next 12 months. But if there is no rain next year ...'

A business manager noted the ageing of the population and said the business tended not to carry many unnecessary or expensive items because people tend not to spend money on those things. Another participant observed:

*The threat to Pyramid is water trading out of the district. It is inevitably going to mean fewer farms, bigger farms, and one of the things linked to that is the need for us to have decent housing and a nice town for all the people who are going to work on these farms. People haven't invested in housing because rural house prices haven't risen to the point that you can make money. If you want to put up a nice house you are up for a minimum of \$200 000, and there is not a house in Pyramid Hill that has ever sold for that.*

### *The community*

The local schools have also been affected by changes in water allocation. One of the headmasters reported:

*We got a \$50 000 grant last year to put in an irrigation system on our sports ovals on the basis of our allocation of 17 megalitres, and now they are saying we will only*

*get 20 per cent. So we have a very expensive irrigation system but we will have to buy water at a very high cost to maintain the playing facilities for our school and for our community.*

One participant concluded that the town would persist despite the challenges it faces: 'There is huge resilience in this community—the ability to knuckle down and do what's required. Nothing will hinder them'. Another added, 'Tough economic times and drought conditions don't help us. Having towns that look like they are deserted because their lawns are dead and there's no greenery in the main street is working against us. Our focus is to drive economic development. Its tough, but it brings jobs and people'. And, as one of the most senior residents argued, 'The more we can do for ourselves, the better we are placed to resist the abandonment of this community'.

## Discussion

The benefit of water trading for Pyramid Hill has been the reduction in salinity and the emergence of innovative ventures such as Pyramid Salt. Some farmers in the district have been able to maximise the benefits of water trading, but the community has not fared as well.

Of all of the case study communities, this was the saddest. The loss of water from the district has meant the loss of farms and productivity and a consequent loss of people and income for the town. The traditional residents who remain are passionate about their community, committed to sustaining what they have, and deeply concerned that, should water be totally removed from the district, the town will die. Unemployment is relatively low because of the job opportunities at the factories. Further reductions in water allocation could affect supplies for the pet-food factory and the abattoir. Being within an hour's drive of larger regional centres, many workers would probably leave in search of other employment opportunities.

In most respects Pyramid Hill can be described as a typical rural community. The only factor that perhaps distinguishes it is the large cohort of transient workers, who form a distinct 'other' group. Members of the core community of Pyramid Hill choose to live there. They accept that there are compromises that must be made as a result of that choice. They understand that not all services and facilities will be available, but basic services that sustain the fabric of the community are justifiably expected. As is the case for the Cohuna community, health services at Pyramid Hill are under threat because of the continued population decline. This could lead to the loss of a doctor and the aged care facility. With no ready access to medical services, many people will leave. Once services are withdrawn it is difficult to have them reinstated.

There is a strong attachment to place among the residents, many of whom are elderly and would prefer not to leave the district. But by all accounts this community is tenacious, and ventures such as Pyramid Salt are evidence that it is also creative.

## Community views in Boort

Boort is about 100 kilometres north of Bendigo, 52 kilometres south of Kerang and 250 kilometres north-west of Melbourne. Like neighbouring Pyramid Hill, it is part of Loddon Shire and is managed through the shire office in Wedderburn, which is 40 kilometres to the south.

At the time of the 2001 census, the population of Boort was 760. It is now estimated to be 800, with 1600 people in the immediate district. The town is built around a group of waterways and lakes, including Little Lake Boort, which is a popular attraction for water skiers, the owners of power boats and sailing craft, birdwatchers and bushwalkers (Loddon Shire 2006).

As part of this project, a small group of residents participated in a focus group. Harvest had begun in the district, which prevented many interested farmers attending. As a result, several face-to-face interviews were conducted in order to obtain additional information. After an initial general description, this chapter presents a summary of the findings.

## Economic profile

Agriculture—dryland and irrigation cropping and sheep and cattle production—forms the basis of the local economy. Vegetable growing, primarily tomatoes, occupies a very small area but is important in economic terms.

Boort's climate and soil quality, as well as access to water via the Waranga Western Channel, have resulted in Timbercorp establishing a 2777 hectare olive plantation—one of largest single olive groves in the world. An onsite olive oil-processing plant can process more than 50 000 tonnes of olives a year for premium extra virgin olive oil and employs over 100 people. Among other new types of farming are a 143-hectare vineyard and aquaculture (Loddon Shire 2006).

Associated industries in Boort include a hay mill, agricultural machinery supplies and repairs, and other rural supplies.

## Community services

Boort has a district hospital that offers medical care, minor surgery, residential aged care, dental services, and community health and support services. There are three doctors who service a wide area; one of them is stationed in Boort. There is a primary school and a secondary college. The Boort Resource and Information Centre is the Loddon Shire office and acts as a rural transaction centre. It provides a wide variety of services—adult education, a gymnasium, Centrelink access, and so on.

The town does, however, lack access to some services.

For example, there are no physiotherapy services and there is no public transport, which particularly affects older people. Travellers need to take a bus to Durham Ox in order to connect to train services.

## Community profile

### Community strengths

Participants in the focus group were asked to define the best things about the Boort community. They were proud of the strength and unity of their community, which had remained steadfast despite drought and the downturn in agricultural industries. One explained:

*In many other towns populations have gone backwards, but the population of this town has stayed strong. There are a great number of young people. The numbers in preschool, playgroup and schools have increased. I think it's the unique location, the peace and quiet, and it the greenery around it; and it's a strong community.*

Focus group participants were also asked what factors were contributing to population growth. One of the local business owners responded:

*There is a hay mill here, olives and 600 acres of grapes, which we never had before. The mills have been here about 25 years, and the amount of trucks that come through and bring hay here is enormous. But the drought's had an impact on them.*

*There is employment with the olives, and that flows into the town and to other businesses and they require employment. People have come here; they find a quiet and reasonable place to stay, and they are getting jobs. There have even been kids that have gone away to uni and got jobs and got married and started to have a family; then they have come back on farms. I can see what comes through my business, which wasn't there before.*

One rural business owner highlighted the value of the area for agricultural production:

*The area north of Boort has the maize record—21 tonnes a hectare. You don't do that on bad ground. It's probably one of the biggest hay production areas. Plenty of fat lambs. Unfortunately, people drive through the worse part of the district on the Loddon Valley Highway, on the true Tragowel Plains, but there are some very diverse operations, dairying and horticulture. I would say with the soil and climate here, you could grow anything.*

A Loddon Shire representative observed:

*Boort has a very strong history of dryland and irrigation farming. It's a community that's adapted very well to irrigation because of the soil types there and has done very well out of it. There are some quite substantial farming enterprises, particularly west of Boort, which provide great wealth to that community. There are tomato farmers north of Boort, which is a very successful industry. There are lucerne mills and specialist hay growers supporting those mills, which has also added to the economy. So it's generally a very healthy economy. It's a very proud community, parochial and rightly so: there is a lot to be proud of. They have put a lot of effort into beautifying the town and making it a nice place to live.*

Residents were very proud of their lake and its surrounds for what this brings to the community by being a place for people to come together, relax and have fun, as well as the tourist revenue it brings. The local caravan park is very popular during holiday periods but also provides accommodation for seasonal workers. One focus group participant said, 'The lake is the hub of the town, and in summer it makes the difference between just being a Mallee town and a tourist centre really. Harvest finishes in Mallee towns and nothing happens after that. They are just dead. But this is a hive of activity. The town's population doubles in summer time'.

Another added:

*It's not only the people that use the lake: we have just had a rugby tournament, and people who hadn't been to Boort before were really taken with the place. They said the aspect of a town with water—they will be back again.*


*It's a really good sporting town, too, because of the water. A lot of towns around us haven't got water for their footy and cricket grounds, tennis and all that. Because we have the water, sport is really strong. We play north-central league. We have 17 teams in the competition; it's pretty strong. They are all Mallee towns—Wedderburn, Wycheproof, Donald and Charlton. And there is netball and hockey.*

An interview with one of Boort's young people, who was about to leave for university in Melbourne, confirmed these observations. He valued the Boort community, the lake and the environment. A promising musician, he has had to travel to Kerang for music lessons for some years and now must go to Melbourne to continue his studies. He said fun for young people, such as going to the cinema, meant having to travel for one hour to Bendigo. He valued the local school and believed he benefited by being educated in a smaller school: 'Everyone knows you. You can't keep a secret, but its very friendly. You get used to what's available. There is a lot of sport, tennis hockey and netball'. What he really missed as a result of living in a small community was access to broadband internet. Although the school had access, he found studying for Year 12 difficult without access at home.

### *Community cohesion*

Most participants emphasised the strong community spirit in the town. One said:

*I can remember back in 1990s when things were down in the dumps—the amalgamation of the shires—we lost confidence and everybody said, 'How am I going to get out of here?' But the community got together and got going again and tried to keep it at the high level it always has been.*



A health professional demonstrated the caring, supportive nature of the community. Because of the lack of services in town, hospital staff are careful not to ask people to leave hospital if they are not sure whether they have someone to care for them at home. The staff will ensure that someone provides post-operative care such as meals on wheels or home help—‘even to tucking them in at night if the patient chooses’.

As with the other communities studied for this project, churches play an important role in sustaining the Boort community. A local minister in Boort reported that the church was very strong: 100 people regularly attended services, and a youth group had 25 regular members. Home groups that meet regularly have provided support for individual families who were struggling. Recognising how important it is for people to get away from the farm, the church organises social events to allow people to come together. The minister reported, however, that, with the downturn in agriculture in recent years, up to 50 people had left the congregation. Young people also leave to attend university or work in the city. Sometimes their families follow them.

The shire representative also acknowledged the community cohesion in Boort:

*Boort is very cohesive. It's not necessarily homogenous. There are quite a lot of differences amongst the people. But as a town they manage their affairs from within, and when Boort talks to us it speaks with one voice. It's a consistent, solid message. They are very well organised. I think it comes from strong leadership in the town. That's born out of a strong pride and a genuine desire by many in the town to make sure their town succeeds.*

### Community problems

Boort faces many of the problems small communities face in Australia, among them a decline in local business, the loss of farm families from the district, an ageing population and, currently, the effects of drought and water restrictions.

The shire representative observed, ‘Population loss is the greatest challenge. In fact, that’s the greatest challenge for this municipality and for all of rural Victoria—certainly northern Victoria. Farms are amalgamating. The farming sector is reducing in size’.

Crime was not a concern in Boort, although there were some minor problems with domestic violence and affray. The local police officer had been in the town for 19 years; he was well liked and respected and has obviously worked out how to police a small community effectively: ‘It’s a clean-living town. If I come to them, they know there is a problem. They know how I operate. Stretch the rubber band but don’t break it. I might give someone a warning for a broken tail-light, but if a month later it’s still not fixed they get a \$150 ticket’. He maintained that the crime rate was low because there was no public housing and he was adamant that theft of water or irrigation equipment would not occur in the district and that cannabis production was unlikely because of the lack of sufficient water: ‘It won’t happen here—not with the people I know’.

### The impacts of water trading on the farming community

Participants described their experiences with water trading and the impact of the market on farming in the district. One began, ‘In our district we have two very distinct soil types. One is just hopeless without irrigation water; that’s our heavy black clay. Where a lot of water has been sold from is the red soils; they can farm them dry. But on the black soil it takes so much water just to get them wet’.

Temporary trade in the district was seen as a valuable option if irrigators wanted to retain capital ownership of their water while generating an income by selling water. Market forces acting through the trade in water entitlements were, however, perceived to have major consequences for the district. One participant described permanent trade as ‘an elephant in the lounge room’; he continued:



*Economic rationalism has serious consequences for rural communities. It is the single biggest threat to this district. Pyramid and Boort irrigation area is a viable irrigation area. Permanent trade will see water from this area stripped out and leaves the water authority with significant stranded assets, with farming properties in an unviable situation at the end of a channel. While there is an economic argument that water should go to the highest economic use, the market is saying that grapes and citrus is the highest end use, which strips water from grazing, dairy and cropping country. But we have seen how feeble that market is if we look at what has happened to grapes. Meanwhile, the irrigation water from the Loddon is gone and will never return. It's not a perfect market and the effects on micro-economies are devastating for the communities.*

A local agronomist agreed:

*Permanent trade within the district is probably not an issue. But as soon as it leaves the district, every other irrigator has to pick up the bill for the infrastructure and the service. So you have the same cost spread across fewer people. It's probably going to get worse with the removal of the cap. In an area like this, if farmers aren't making money from their water and they have debt, the obvious thing is to sell the permanent water to get rid of the debt and trade on temporary water. But it's a continual downward cycle. The whole district could be based on temporary. Get a year like this, GMW might not deliver a megalitre to the district. The security of the area is at severe risk.*

Participants in the focus group were united in their opposition to water leaving the district. They were also apprehensive about the long-term consequences for the community.

One of the farmers explained:

*We have only got a small irrigation lot; most of our farm is dry. With the year that it was, it just wasn't feasible to put water out on our crops because we only had 21 per cent.*

*You couldn't follow it through so it was better for us to sell some of that water temporarily so that we could have an income. It's paying part of your water rates anyway. The permanent trade: I don't think they should be separating the water from the land because the land where we are, without water, would be useless, you just can't grow anything on it.*

Another continued:

*In 2002 we only got 57 per cent of our allocation and the water was reasonably valuable and this year, of course. In other years, with 100 per cent allocation, it is OK because the price is not way up here. So people were still using it, still producing products. The problems arise when we have low allocations: well, it goes out because the fruit people have got to keep their trees alive, no matter what it costs. A lot of dairies have got into trouble because they have sold their water right and just live on temporary water and now it's gone through the roof and they don't have the water ...*

*I think with the selling of water out of the district there will be changes. There seems to be people outside who are telling us—or seem to be leading us into a water policy that they really don't know what the final outcome will be. There are people who perhaps haven't had actual farming experience influencing the policy and we feel pretty helpless.*

*People can't afford to buy water, so it's sold off separately. But people have to go on and live, so you can't blame them for doing it. It's too late now. The horse has bolted. I think the water still shouldn't be allowed to leave the district, because that's left farmers with the maintenance of channels. I don't know what the future is for our district. With our irrigation season, our summer cropping program is just starting. But there is not going to be that income from lucerne, tomatoes, etc. because water allocations are so low. There is no commodity out there that we can grow that is worth \$600, roughly the equivalent of a*

*megalitre. So water will be sold on the temporary market. I'd say you will start to see the cash flow problems early in the new year.*

He believed water trading in concert with the drought had affected the town:

*This drought—well, we are in uncharted waters because we not only have a dry country drought we have an irrigation drought as well, so it's going to be a double whammy. A lot of businesses around here are geared to irrigation with plant and staff, and that's all sitting idle because we have an irrigation drought and that effect hasn't kicked in yet. Probably the maintenance-type spending is happening now. It's a bit quiet. After Christmas, spending on new stuff and improvements is just not going to happen because there won't be the cash there to do it. There are a lot of farmers out there that aren't going to see a lot of income until this time next year.*

Concerns were raised about stranded assets and uncertainty about continuity of the water supply: 'I worry about the future implications of it. If too many people sell water off our channel I don't think we will get our supplies. That is everyone's problem'. One of the business owners added:

*We own the water, not the government, but they keep changing the rules and the structures. Everyone is frightened the costs will go through the roof and we won't be able to use water. I don't think I have many customers who are confident about buying more permanent water. They're keener to sell because there is so much uncertainty at the moment. A lot of people are worried we could wake up tomorrow and the government will take our water. Governments, state and federal, have done so much to put uncertainty there, you couldn't invest with confidence.*

The Timbercorp olive plantation was seen as a mixed blessing:

*Because we have got the water coming in for the olives, it is a huge benefit of keeping the water in this area. It keeps your infrastructure and all that in place, like in the employment of water bailiffs etc. But the down side is that small irrigation properties ... are selling their water and that's going out of the district. They are not producing as much as they normally do and that leads to a loss of employment. We have sort of a mix here, the trade allows them to bring 18–20 000 megs into the area, which has been good for us, but the other side is that the water that is going out is a loss.*

### The impacts of water trading on the non-farming community

The focus group participants were asked about the impact of water trading on their local economy. Business owners were asked whether water trading had affected their business and about their perceptions of the impact on other businesses in the town.

### The associated industry perspective

One local business operator asked why more investment does not come to the area. He saw positives and negatives associated with managed investment schemes:

*I can't understand why water is moving to investment on the Lower Murray. Why isn't the investment coming to the water? They create a bit of a false economy: they can pay whatever they like for water. Temporary water is currently \$650 a megalitre. It would be interesting to see what it would be if the MISs didn't exist.*

He explained:

*They [the managed investment schemes] have a negative impact on towns. They don't spend any money locally.*

*They bought out 10 of our customers and we would have dropped our turnover by half. As a result, we downsized staff. We only just got back there in the last three years. We offer more services; we travel further out to pick up more business. Several other businesses in town have suffered the same. Then the services—the doctors, the hospital and schools—they all suffer as well. They try and tell us that they do a lot for the town, but I’ve yet to see it.*

*We’ve only got one MIS here. Our type of business, they tender for nationally. There are really only two companies that can tender for it because they have locations at all their sites, which means that we can’t compete. They employ some locals and they would be spending money in town, but that’s limited.*

*They have done more harm than good. The positive is they do bring in a lot of water. With that there is a lot of headaches. Customers below them get a lot of service issues when they start pumps. They don’t get any water, their wheels stop.*

Fieldwork for the project coincided with the onset of harvesting dryland crops in the district. Although the harvest was small because of the drought, it was enough for local farmers to begin. The manager of a local tyre company reported that he was not noticing any downturn in his business with the restrictions in water, particularly at harvest time, because the dryland farmers need tyres to operate. The owner of a large, long-established agricultural machinery company with branches elsewhere in Victoria and in New South Wales did report that business had slowed, although he had not yet reached the stage of standing down staff. He was concerned, however, that he might have to consider this if the lack of rain and water persisted. He noted that there were some small pockets in the district that had crops and that the situation was far worse in New South Wales. He remained optimistic: ‘It will rain eventually and everything will return to normal’.

## *The central business area*

In the central business area there were a number of empty shops. One resident explained that the town had lost businesses because people had left the district and because small local businesses are unable to compete with larger regional centres:

*Boort over the last five years has really taken a big dive in local businesses. There are about eight shops in the main street in Boort, like craft and opportunity shops, that have moved in as other businesses have closed down, but they are shops that really have no impact on our local economy. All they are doing is filling up the space. We have lost our main electrical shop and the main clothes shop. It closed six months ago. We’ve lost one bank, our printing works, our motel and Elders. We are now back to one machinery dealer, and he is struggling, and we are down to two garages. We used to have a Holden dealer, a Ford dealer, a Nissan dealer and a Toyota dealer; they have all gone.*

He added:

*I guess it’s all because farms have rationalised over the last 15 or so years. Once upon a time a 1000-acre farm was sufficient. Nowadays you need 3000–4000 acres. Farms have to get bigger to survive. For every four farms that are sold we lose three families. A lot of those families have moved on to bigger regional centres like Bendigo, Melbourne, Geelong, Ballarat and Echuca. People have come to expect more, and Boort is just a small rural town. Man can’t live on olives alone; we need more than olives in our community. I think it’s just a sign of the times. There’s really nothing bad that has happened in Boort—there’ve been a lot of good things happen—but the fact is that the pressure is on small rural communities to survive. People nowadays have fast modern cars; they can travel to Kerang, Swan Hill, and Bendigo to do their shopping. Most of the businesses that are housed in a small town really have to compete with some of the larger ones in bigger towns, and it’s just too costly for businesses to stay open. They don’t make enough; they don’t sell enough.*

These concerns were echoed in the focus group:

*The businesses that stay strong are the necessary ones, like the supermarket, the chemist, the hardware, or some other service that is important to the community. More shops may start, if people are just looking for something to keep them occupied. But it will be hard to get it back to where it was in the 1970s—the bottle shops, the bakeries, three milk bars and all that.*

A shire representative said:

*The hay mill has just put off 15 employees because they don't have the hay to process this year due to the low irrigation allocation and effectively no spring rain. There used to be two hay mills, but they have now amalgamated. If you work in a hay mill in Boort and get put off, you are not going to find other work in Boort. There is no industry, agricultural or other, that would be expanding. The olive plantation has their numbers pretty well secure I suspect. There could be some potential work with the harvest season, which starts in late March and goes through to the end of June, but that's a long time between pay cheques for families. So the risk is those families will leave and they won't come back.*

A health worker in the town noted that the loss of jobs from the hay mill meant the hospital would probably lose two of its nurses because their partners were among those retrenched.

The manager of one local business reported that his turnover was very dependent on the lake. In summer, if the lake is full the tourists contribute a great deal to the town's economy. If water in the lake is down, though, the number of tourists is down and so is his business. When asked about the impact of Timbercorp on business, he said employees leave early in the morning and return home late at night and so tend not to spend money in the town.

Asked if water trading had affected council rates, the shire representative replied:

*Rates have remained reasonably stable because generally water retention has been reasonably stable. Within the*

*irrigation region it's moved around. It's generally moved from small farms to larger corporate operations and large family farms. We might have lost a bit, but it hasn't been substantial. However, we are about to lose a heap with the unbundling of water from land, which is a huge issue for us. We are about to have 12 per cent of our capital improved value removed from our rate book, which means if we don't put our rates up we will lose revenue. We have been busy preparing our community for this increase in 18 months. The irrigation farmers will get a rate reduction because water from their land is removed. Their capital improved value will reduce so their rates will reduce. But dryland farmers, town, commercial and industrial properties will go up by about 10 per cent. If we don't do that we will have to reduce services. There is not the fat in our budget that we can absorb that. We don't think the community can stand a 10 per cent increase given that in 18 months they will still be recovering (or hopefully recovering) from severe drought.*

### *The community*

Drought and water restrictions have threatened Lake Boort. In 2005 the community petitioned authorities to ensure that the lake remained filled for the summer. The shire introduced a levy for boats and jet skis to meet the \$15 000 cost of replacing the 500 megalitres of water lost to evaporation. The lake is seen as one of the few sporting lakes in the state with enough water left to operate.

It was interesting to note that farmers were aware of the social value of the lake for the community and 'parked' their water, or stored it, in the lake until they needed it. There was a recognition that the area provided a release for people in the district who needed to escape from the pressures of the farm, particularly in times of severe drought. One resident explained:

*The lake has only got 23 per cent, the same as the irrigators. We lose about 600 megalitres for the year through evaporation. Evaporation is a killer. In October this year we lost more water than we did in January*

*last year. Goulburn–Murray can use this lake as storage because we can get it back. We have put a pump in so that they can park 100 megalitres there and we can get it back. We can borrow to keep the lake full at its peak time and give it back in off-peak. The problem we had this year is because water has become so valuable and most of the water in the channel system has been sold. Hopefully, because of the drought and the social impact of not having water here, because this is the only lake within a huge area, we can convince the government to look at it. We have an excellent track record; we have always given back the water that we have borrowed—never missed. The [Country Fire Authority] have come on board too because there is a huge fire risk with the drought. There is no other water in this area where they can pick up using their new choppers. There are no lakes, farm dams, whatever, that have any water, which makes this lake a huge asset for firefighting.*

The focus group was asked, assuming normal climatic conditions, where they saw Boort in five years' time. One replied:

*It should be good apart from this hiccup. It was improving all the time really. Boort is pretty wealthy; there is a lot of old money here. There are a lot of established people here. It is slightly breaking down at the moment, but just talking with others from different towns, there is a different ethos here. Kerang has a lot of children dropping out of school but we don't have that problem. There is a good support system in the high school to encourage students to stay on with their studies. Pyramid is just too small to be really viable. Wedderburn has a lower social-economic base and houses seem to be a lot cheaper. We don't get that because the houses here are dearer. When you look at the actual farming areas around Wedderburn, its only grazing country not cropping like here. That's the beauty of Boort. There are so many different things we can grow here because we have really good soils, water, and infrastructure like the Warranga channel which runs right through the place.*

## Discussion

Although Boort is only 40 kilometres west of Pyramid Hill, the two communities are very different. Boort does have the advantage of being a larger town, and certainly some of the soils are better, allowing more income from dryland agriculture. There is more wealth in the district, attested to by the attractive homes surrounding Lake Boort. There is a strong attachment to place, largely because of the long and prosperous history of traditional farming in the district. The community is also very cohesive: most people are local to the area and share similar values and goals. The lake is the town's greatest attribute. The social benefit it provides for the town and for the wider district is vitally important and something that should be kept in mind in any future policy development for this area.

The Boort district is unique in that it has been both a significant importer and a significant exporter of water. The presence of Timbercorp has had positive and negative effects for the town. It has brought income for some local people and some local businesses, but the central business area has suffered a major loss of businesses, and empty shops do nothing to make the town appealing. Local industry is faring a little better, sustained by dryland producers, although the loss of suppliers such as Elders is a concern.



Community members



## Summary

Water trading has had a big impact on the Pyramid–Boort region in the last decade or so. A large amount of water has been traded permanently out of the region, reducing the amount of water available for irrigating crops. This has, however, allowed for better management of salinity.

A range of factors were seen as contributing to the observed patterns of water trade in the region. For example, the influences on dryland and irrigated industries have had an important effect.

Irrigators in the region perceive a variety of benefits and costs associated with water trading. On the plus side, they recognise the trade's ability to facilitate adjustments in their cropping activities—especially opportunistic cropping—and assist with cash flow, debt and drought management. On the negative side, irrigators expressed concerns about the risk of stranded infrastructure assets, being forced into dryland farming, degradation of the river channel, and the potential for build-up of pest plants and animals on vacant land.

Exporting of water from the region has been accompanied by the decline of major centres in the region.

In Pyramid Hill, a community of 400 people, the continued loss of water has led to the loss of farms and production and the subsequent loss of people, income and services from the town. Local business owners were finding it difficult to compete with people shopping out of the town. Returns were down because there are fewer people in the district and those remaining have little to spend. Furthermore, transient workers in the town rarely spend money locally. The traditional

residents who tenaciously remain are passionate about their community, committed to retaining what they have, and deeply concerned that, should water be removed totally from the district, the town will die. To their credit, some innovative ventures have been established to sustain the local economy. Among these are an abattoir, a quarry, a pet-food factory and Pyramid Salt, a company that is using the region's salinity to extract and market salt. There is a social divide between the large cohort of transient workers and the traditional farming community.

Boort, with a population of 800, is unique in that it has been both a significant importer and a significant exporter of water. Some of the better soils around the town provide income from dryland agriculture. Water trading contributed to Timbercorp establishing a large olive plantation in the area, which has had positive and negative effects on the town. The families that owned the farms Timbercorp bought have gone. And, although the company has provided some employment and income for the town, much of its business is conducted away from Boort and there are many empty shops. Nevertheless, the long-established and wealthy farming community that remains is cohesive and committed to the town's wellbeing.

The case study brought to light a mix of views on the impacts of water trading. There is widespread concern about the consequences of changes in land use associated with the trade, although it was generally recognised that drought had greatly affected all agriculture in the region. Many people said they had difficulty untangling the effects of water trading from things such as drought, changes in commodity prices and the trend towards farm aggregation.



## Case study C: Rochester, Central Goulburn and Kerang–Cohuna

### Introduction

This case study is one of three studies to form part of a project examining the social and economic impacts of water trading, with the objective of informing policy in this regard. The project focuses on regions where water trading is prevalent—the irrigation districts of Goulburn–Murray Water and Lower Murray Water, on the Victorian side of the Murray. In particular, it seeks to quantify and report on, through the case studies, the actual impacts of water trading on individual water entitlement holders, industries and communities in the Murray Valley, in order to test the assumed benefits and perceived concerns arising from the trade. The information examined was collected through a series of interviews and consultations in the case study regions, involving irrigators and the broader community.

Apart from Rochester, Central Goulburn and Kerang–Cohuna, the other regions studied were Sunraysia and Pyramid–Boort. Much of the material presented for the Rochester, Central Goulburn and Kerang–Cohuna study reflects local people's views about their experience of water trading, rather than the authors' views and analysis, which are presented in Part One.

Rochester, Central Goulburn and Kerang–Cohuna are presented as one case study in order to consolidate the similar experiences found in the three areas. Dairy farming is the main irrigated enterprise in each of them; mixed farming is the next biggest use of water in each, and horticulture comes third. Economically, the areas are similar; geographically they are different. Kerang–Cohuna is on the Murray below the Barmah Choke. Rochester and Central Goulburn are on the Goulburn. The proportion of land suitable for irrigation is higher in Central Goulburn than in Rochester.

This case study is structured as follows. After a brief description of the Rochester, Central Goulburn and Kerang–Cohuna regions, the pattern of water trade into and out of the regions in the past decade is described. Focusing first on irrigated agriculture, the study then examines the main forces—irrigation history, institutional settings and the changing fortunes of particular products and industries—affecting this water trading and the costs and benefits of the trade, predominantly from the perspective of those in the affected industries. The study then looks at the experience of people in the towns of Rochester, Kyabram and Tatura (Central Goulburn) and Kerang and Cohuna, again largely from the perspective of the people interviewed. The main lessons from the case study are brought together in the concluding summary.

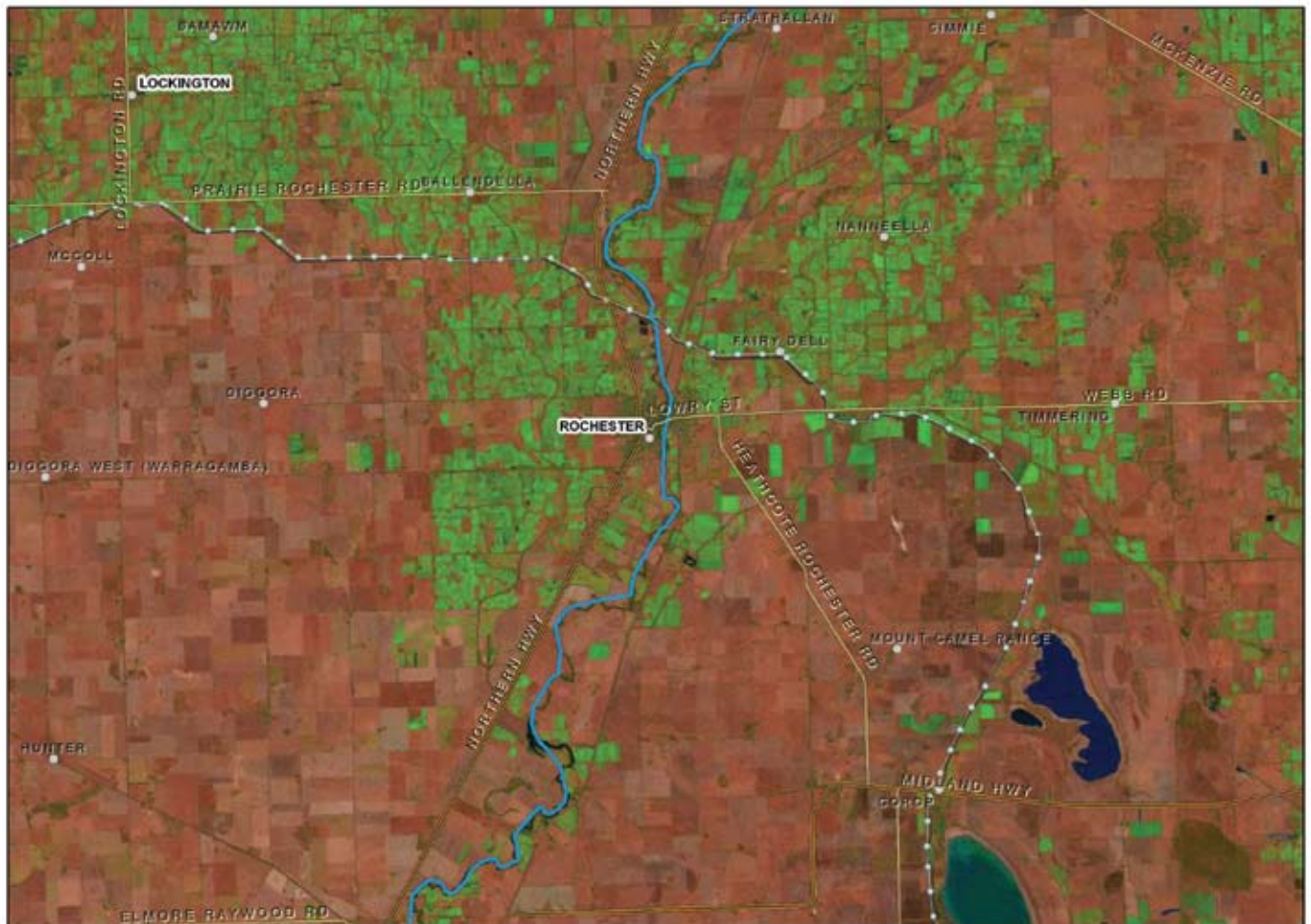
## Location

### Rochester

The Rochester Campaspe irrigation system provides water to 1290 customers via the Goulburn, Murray and Campaspe Rivers and some 664 kilometres of distribution channels and 476 kilometres of drains. The main sources of water are Lakes Eildon and Eppalock; supplementary supplies come from Greens Lake. Water entitlements amount to 187 396 megalitres in the Rochester area and 20 202 megalitres in

the Campaspe Irrigation District. The Rochester Irrigation District covers 107 750 hectares, of which 61 700 hectares is irrigated; the Campaspe Irrigation District covers 9300 hectares, of which 5010 hectares is irrigated.

The Waranga–Mallee Channel, built just after the beginning of the twentieth century, runs for 480 kilometres from the Waranga Basin near Rushworth to the Eastern Mallee area west of Boort. The Campaspe Syphon takes the Waranga–Mallee Channel under the Campaspe River through three 90-metre concrete pipes (Rochester.org 2007).



Source: Murray–Darling Basin Commission.



## Central Goulburn

The Central Goulburn Irrigation District covers 173 053 hectares, 113 106 of them irrigated, and is one of the largest irrigated areas in northern Victoria. It extends south and west from the Goulburn River and takes in the towns of Ardmona, Echuca Village, Girgarre, Kyabram, Lancaster, Merrigum, Mooroopna, Murchison, Stanhope, Tatura, Tongala, Undera and Wyuna.

More than 2800 irrigated holdings are serviced via an extensive network of 1460 kilometres of distribution channels and 882 kilometres of drains. Water rights in the area account for 385 000 megalitres, supplied mainly from Lake Eildon, which has a capacity of 3 390 000 megalitres (Goulburn–Murray Water 2006b).



Source: Murray–Darling Basin Commission.

## Kerang–Cohuna

The Torrumbarry Irrigation Area extends along the River Murray from Gunbower in the east to Nyah in the west and southwards to include the towns of Cohuna, Kerang and Swan Hill. It covers 167 000 hectares, of which 150 000 hectares are suitable for irrigation. The irrigation system supplies about 2650 irrigation customers and a further 600 domestic and livestock customers.

Water for the Torrumbarry area is released into the River Murray at Hume Dam. Water from Dartmouth Dam, on the Mitta Mitta River, provides supplementary storage for Lake Hume.



Source: Murray–Darling Basin Commission.



## Patterns of water trade

### Rochester

Since trading began Rochester has been consistently transferring (net) annual water allocations into the region through temporary trading. In most years the amount has been about 10 000 megalitres, but in 2000–01, 2001–02 and 2005–06 the net transfer of water into the region far exceeded 20 000 megalitres. The region's experience in permanent water markets has been more varied: between 1995–96 and 2002–03 water entitlements were generally transferred into the region (with the exception of 2000–01), with net transfers in many years being about 1000 megalitres; in the three years from 2003–04 to 2005–06 there were net transfers of water entitlements out of the region, exceeding 3000 megalitres. These three strong years of selling water entitlements meant that the cumulative effect of permanent trade since 1995–96 has been to shift about 4000 megalitres of water entitlement out of Rochester. However, purchases of temporary water more than offset this in terms of the available water in the district: the combined effect of all trading was to reallocate water into Rochester through trade—an increase of nearly 25 000 megalitres in 2005–06 compared with available water in the absence of trade.

### Central Goulburn

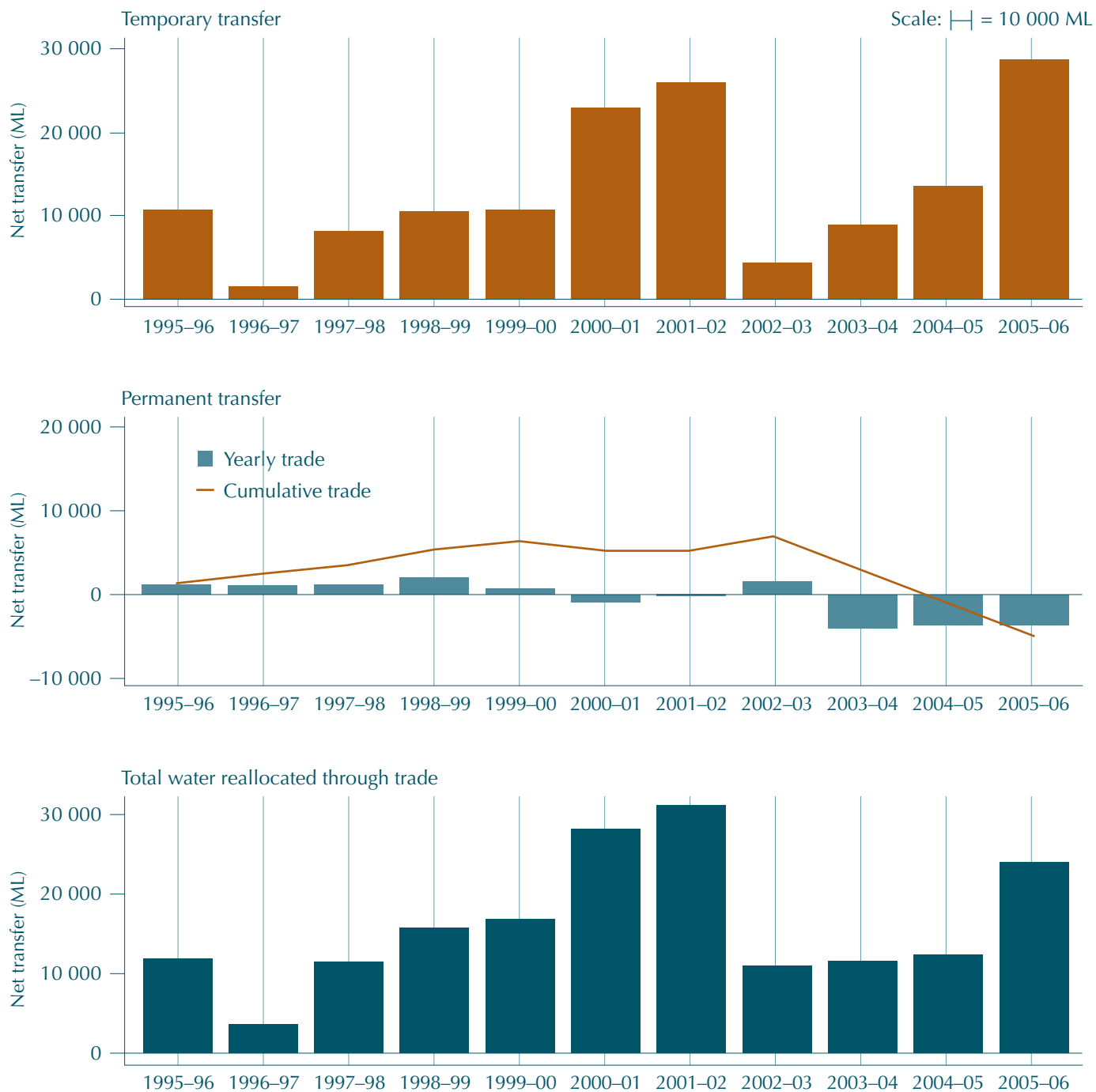
Central Goulburn has had an experience similar to that of Rochester in the temporary and permanent water trades. This region has been consistently making net purchases of water allocation in temporary markets; 1996–97 was the smallest of these, while 2001–02 and 2005–06 were among the largest. A notable contrast with Rochester's temporary trading behaviour is that Central Goulburn transferred in

large volumes of water allocations in the drought year of 2002–03. It transferred in permanent water entitlements from 1995–96 to 1998–99, but this trend reversed from 1999–00 to 2002–03, such that the net cumulative effect of permanent trading was to leave the region's total water entitlement broadly unchanged. As with Rochester, the three years from 2003–04 to 2005–06 saw significant net permanent trades out of Central Goulburn—greater than 5000 megalitres. This has led to a cumulative amount of about 20 000 megalitres of water entitlement being traded out of the region since 1995–96, which was only just offset by the temporary water net purchases in 2005–06.

### Kerang–Cohuna

Kerang–Cohuna appears to have been increasing the volume of water allocations it transfers in. In 1995–96 and 1996–97 volumes were relatively small; from 1997–98 to 2002–03 temporary trading brought in 10 000 to 15 000 megalitres (except for 2000–01); and then from 2003–04 to 2005–06 net temporary transfers were greater than 30 000 megalitres. Meanwhile, permanent trading has been reallocating water entitlements in the other direction: since 1998–99 the Kerang–Cohuna region has been consistently (net) selling water in permanent markets, such that a total of nearly 30 000 megalitres has left the region since trading began. This selling of entitlements has, however, been outweighed by large temporary water (net) purchases in terms of reallocating water to the region.

**Figure C.1 Rochester water trading, 1995–96 to 2005–06**



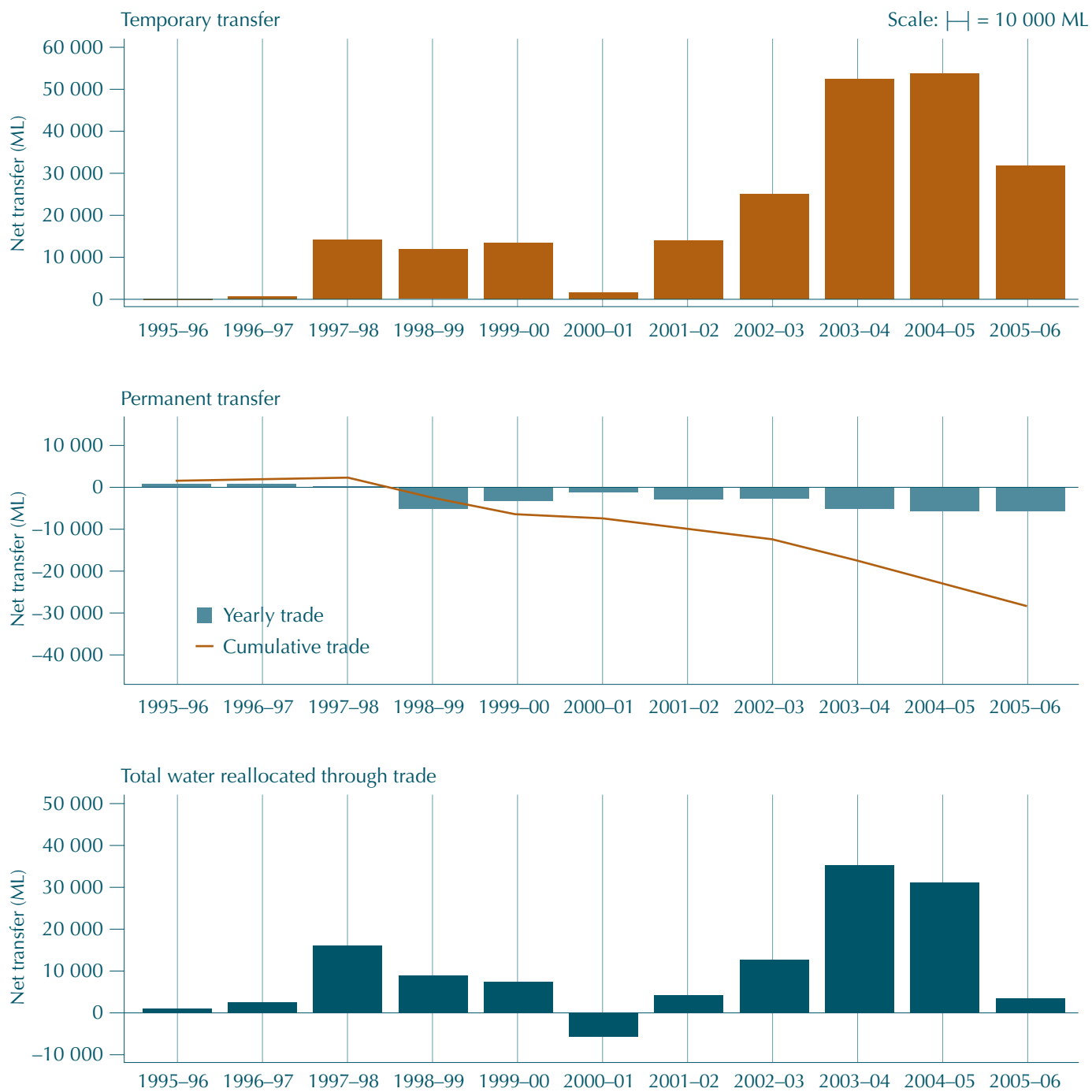
Sources: Goulburn–Murray Water annual reports, 1995–96 to 2005–06.

**Figure C.2 Central Goulburn water trading, 1995–96 to 2005–06**



Sources: Goulburn–Murray Water annual reports, 1995–96 to 2005–06.

**Figure C.3 Kerang–Cohuna water trading, 1995–96 to 2005–06**



Sources: Goulburn–Murray Water annual reports, 1995–96 to 2005–06.

## Key drivers in irrigated agriculture

Dairying is the main enterprise in Rochester, Central Goulburn and Kerang–Cohuna. Tomatoes are also grown, and there is mixed farming such as summer cropping and sheep and cattle grazing (Goulburn–Murray Water 2006a). Farm production has many similarities in the three regions, and their experiences have been similar.

### Irrigation history

#### *Initial distribution of water entitlements*

Broadly, each block in the Goulburn–Murray Irrigation District was allocated a legal right to sufficient water to irrigate the entire block. This was about 1 acre-foot of water per acre, equivalent to 300 millimetres of rainfall a year (Barr 1999). In metric terms that is about 3 megalitres a hectare.

#### *Development of the districts*

Goulburn–Murray Water describes the districts' development:

*Dr Elwood Mead, a distinguished American engineer, was Chief of the Irrigation Investigations Bureau in the US Department of Agriculture when, on the recommendation of the Victorian Minister of Water Supply, the Victorian Government offered him the Chairmanship of the State Rivers and Water Supply Commission. He accepted and served as Chairman from 1907–15 when he resigned to return to the USA.*

*It was on Mead's recommendation that charges for water rights, based on payment per unit volume, were introduced to cover the costs of operation and management of the irrigation and domestic and stock water supply system. The charges had to be paid regardless of whether or not the water was used. The compulsory charge was bitterly opposed by the majority of landholders. Dr Mead appreciated the reasons for the hostility, but told delegates at a Farmers' Congress at Bendigo in 1909 'The inclination of the individual runs counter to the welfare of the State'.*

*Mead was also an advocate of 'closer settlement' and intense culture methods of irrigation. After years of his urgings, and the recommendations of a Royal Commission appointed on Closer Settlement in Victoria, legislation was passed in 1918, transferring permanently to the [State Rivers and Water Supply Commission] the responsibility for land purchase and settlement in irrigation areas. Finally the unified control of land and water that Dr Mead advocated became effective and remained in force for all soldier and civilian settlement following WWI. (Goulburn–Murray Water 2007, p. 1).*

William Cattnach served as chairman of the State Rivers and Water Supply Commission from 1915 until his death in 1932:

*His period of Chairmanship was one of great development of water supply in general. Substantial additions to storage capacity totalled nearly one million acre feet and included enlargement of Lake Eildon and Waranga Basin. The area irrigated annually had risen more than 50%.*

*The period of Mr Cattnach's Chairmanship was also dominated by the administration of Closer Settlement under irrigation. In the Commission's 1915–16 Annual Report it was noted that due to subdivision some 1500 families had been settled where 120 had previously lived. The Closer Settlement Act 1918 provided for the [State Rivers and Water Supply Commission] to administer settlement of discharged soldiers from WWI in areas irrigated, or likely to be irrigated. Such areas in the Goulburn and Murray Valleys included Shepparton, Tongala, Stanhope, Swan Hill and Nyah.*

*Another notable feature of Mr Cattnach's administration was the leading role he played in the establishment of the great co-operative canneries of the Goulburn Valley—pioneering the field of orderly marketing before establishment of today's marketing boards. Ironically his death followed what seemed to be a fairly small injury while on an inspection of one of the Goulburn Valley canneries. (Goulburn–Murray Water 2007, p. 1).*



## *The legacy of the original settlement patterns*

*A Royal Commission on Soldier Settlement in 1925 found that the scheme was mostly a failure due to settlers' lack of capital and experience, the inadequate size of blocks and drainage problems. The War Service Land Settlement Agreement of 1945, however, continued to establish soldiers returning from World War II on farms ... Soldier settlements were provided in the Murray–Goulburn Irrigation Area around Cobram and Numurkah with the development of 120 000 acres of irrigated blocks for fruit growing and dairying. (VEAC 2006)*

The yeomanry ideal and closer settlement did not disappear after World War 2: the Campaspe Irrigation Area was developed after the completion of Lake Eppalock in 1964. It originally consisted of land holdings of about 40 hectares with 160 megalitres of water entitlement.

The size of the initial holdings in each irrigation area and the way the land was laid out are still having effects on farm viability and on the water trade. A farm management consultant interviewed for this project described the legacy of soldier settlement in considerable detail:

*We had waves of soldier settlements after the two wars when the government acquired land and subdivided it into small units; they acquired land on some of the best soils in the region.*

*But you need an understanding of what drives the profitability of farm businesses in this region. It's got nothing to do with land—land's only the thing you put the water on. It wouldn't matter if you had a 1000 acres if you've only got 100 megalitres you only have a 100 megalitres of productivity. So managing water in this environment is about maximising the return from the water you have available.*

*Some people have the mistaken understanding that you need to use every square inch of this land, but land's not the limiting resource, so what tends to happen is that their flexible capital is tied up in water, livestock, plant, machinery and the house and curtilage.*

*Permanent trading, in part, has been the major tool for rationalisation of small holdings in the dairy industry. There are lots of people who have gumboots on at 80 and who would not have anything to sell without permanent trading. More than half the value of their enterprise is in the water. Those small dairy farms are just not saleable as going concerns. They're viable for the existing occupants, who are very often an older couple with low or moderate expectations of lifestyle. They are quite happy to live that humble existence. But if you are talking about a young family trying to buy in with significant debt—buying what is often poor infrastructure—then they're just not viable. They are viable for the existing occupants, unviable for others.*

*If the council allows it, a couple in that position can often subdivide out the house. They can then sell off the water, sell off the livestock, and sell off the unused portion of the land to a neighbour so the neighbour can do something with it.*

*Up until the extreme conditions on the Goulburn this year, when those older couples have split their assets up, the major resources have ended up back in the dairy industry. The land's gone to grazing and is either producing fodder or grazing for replacement livestock; the water's gone to another user, very likely in the dairy industry, and the cows have gone into another herd, so there's been very little net loss out of the region.*

*It is the redundant capital—capital that has no value to another person—that is the problem. You could argue that 1960s irrigation layouts—small bays and 6-inch clay pipes—actually detract from the value of the land. The labour requirements are ridiculously high and the water efficiency is poor, so someone coming in who wants to use it has to pay more than the value of the land to turn it into something worthwhile. They would be better off with bare land.*

*Logically the water will move to an area where someone will use it more profitably. You could argue that we will go through a phase where water will move off the better*

land—soldier settlement areas, small units with poor layouts. It will go to more extensive areas, generally poorer land, where people have laser-graded to reduce labour, not to improve water use efficiency. Water will leave some of the best land and end up on some of the poorer land, but in the long term it will swing back the other way.

The water will, eventually, swing back to better soils of its own accord, but it will be inhibited by the sheer number of houses and small holdings. The government does its best to interfere in economics and usually makes a mess of it. It's going to take 50 years to overcome the legacy of soldier settlements, and there are lots of people locked into soldier settlement blocks who have nothing viable to sell. The only way they can get out of it is to strip assets, so they sell water and the subdivide the house. We will be left with soldier settlement areas with lots of subdivided houses, patchwork blocks of land and poor irrigation infrastructure. It will be a very expensive operation to redevelop that land and it will take quite a long time.

Economics will drive it. People will see a profit in doing something different. In the long term we will see conversion of some of that land to spray irrigation. The cost of land-forming is much the same as the cost of spray irrigation. There's no difference in capital cost between the two. The only justification for spray irrigation, on most soils in this region, is labour saving. If you have a centre-pivot or lateral-move you can reduce labour costs significantly. I have been working on a project at Tatura where we looked at the efficiency of irrigation systems for dairy farms. For 97 per cent of the soils in the region the estimated saving, in converting from an efficient bay irrigation system to a spray system, is half a megalitre per hectare. So you couldn't justify it economically just for efficiency's sake.

Overall, it is probably best if the government stays out of the move back into soldier settlement areas. But one thing the government could do to speed it up would be to remove some of the obstacles to subdivision. Some of the people who are locked into small farms at the moment

are locked in because they don't fit in with the 40-hectare subdivision limit. They can't subdivide the house and curtilage sell it for \$100 000 or whatever which means they've got to sell the whole lot. So the buyer has to buy this useless house. Who wants six settlement houses on the square mile? It might be an argument for buying the houses and pushing them over.

Local government's argument for limiting subdivision to 40 hectares has to do with the provision of service and uncontrolled development. Maybe, if they weren't so rigid, they might go along with a one-off thing where no other houses were to be put on the land.

## Drought management

Dairy farmers and fruit growers have been very active buyers on the water market during the drought. Mixed farmers have been active sellers. With the exception of the extreme seasons of 2002–03 and 2006–07, dairy farmers have been more affected by the drought than fruit growers. Dairy farmers are more reliant on 'sales' water, which traditionally has been expressed as a percentage above water right but is set to be unbundled as a separate entitlement in 2007.

Most fruit growers do not have access to sales water, so the drought affects their water availability only if seasonal allocations drop below 100 per cent of water right.

Dairy farmers have conventionally budgeted on sales water accounting for nearly half of their total water. Water trade has therefore been an important tool for drought management: 'Dairy farmers are traditionally 180 per cent water users, but since 1997 they [Goulburn irrigators] haven't had a year of more than 100 per cent. They had 57 per cent in 2002–03, 23 per cent this year and its not likely to go up. So, yes, there has been very heavy trading on the Goulburn'.

Very low allocations in 2002–03 caused many farmers to take on towering debts. This coloured their approach to the even lower allocations in 2006–07:

*After 2003 we had a good long think about how we would handle that sort of situation next time. We completely revised our mix of pastures, revised our agistment strategies and revised our approach to temporary trade. This season has probably come too soon for us—our pastures aren't to the stage we'd like them to be—but we are a hell of a lot better prepared this time around. At the start of the season we sat down and worked out how much we were prepared to pay for water. Basically, the main question we had to ask ourselves was: are we planning to be dairy farmers in the long term? Once we had answered that—and the answer was yes—once we had answered that, the rest was straightforward. We went out and bought what we thought we needed early in the season, at a price that was in our budget. We see so many people agonising over whether or not they are prepared to buy water at the current price. The worst thing is when they agonise over it for ages and then, when they finally convince themselves it is the right thing to do, the price has gone up and they have to go through another round of agony. Being in limbo just cripples people.*

## Institutional settings

### *The 2 per cent rule*

When permanent trade was introduced the Victorian Government limited total annual permanent trade out of any irrigation district to 2 per cent of total entitlements for the district. The purpose of this '2 per cent rule' was to keep the rate of change in manageable bounds and to ease revenue pressure on the water authorities.

Permanent trading of water out of Rochester, Central Goulburn and Kerang–Cohuna has reached the 2 per cent limit several times in the last few years, and significant trade is likely to continue for some years. Under the National Water Initiative the limit was increased to 4 per cent for 2006–07.

## *Reconfiguration*

Victorian legislation now provides scope for irrigation districts to be 'reconfigured' to improve their economic efficiency. The pressure for reconfiguration is strongest when water has been transferred away from smaller spur channels and pipelines, leaving small volumes to be delivered at high cost to those remaining on the spur system.

Before 2003 there was very little pressure to think about reconfiguration in Rochester or Central Goulburn. The very low allocations in 2003–04 precipitated a reversal of trends, and those districts became net exporters of water. Moreover, the promoters of managed investment schemes started to see advantages in buying their full water requirements at the time of planting and then, while the trees were small and using little water, trading the balance on the temporary market. Goulburn entitlements were especially attractive because, once they were permanently traded out to the Murray, they increased the capacity for back-trading Murray seasonal allocations into the Goulburn, where allocations were lower.

Reconfiguration pressure is now building in Rochester and Central Goulburn. Relative to other parts of Victoria, the pressure for reconfiguration in Kerang–Cohuna is high. The demand for permanent trade out of Kerang–Cohuna has been relatively constant since 1998. Because the district is on the Murray but below the Barmah Choke, it was an obvious source of water to supply horticultural developments in Sunraysia.

## *Interim delivery shares*

'Unbundling' of Northern Victorian water entitlements on 1 July 2007 will result in district irrigators holding delivery shares entitling them to specified volumes being delivered per unit of time during periods of peak demand for the delivery of water. The delivery shares will also confer on them the liability to keep paying for their access to the delivery system even if they sell their water.

To reflect these changes, access and delivery tariffs have been changed in advance of unbundling. This will help protect the revenue base of water authorities, act as a disincentive to permanent water trade out of districts, and allow for setting exit fees based on the present value of this revenue stream.

### Source-tagging

After unbundling, the water shares being used in Sunraysia will be identified as coming from either the Goulburn system or the Murray system. Depending on the season, these different water shares might have different allocations attached to them. The prospect of this change has precipitated much recent trade out of the Goulburn system into Sunraysia. This is largely because allocations on the Murray system have been higher than those on the Goulburn in the past 10 years and, before unbundling, water traded out of the Goulburn to the Murray was assigned the higher allocation of water coming out of Murray storages. Some of these allocations have then been traded back up the Goulburn system. This will not happen once the water shares are 'tagged' to the source storages.

Further, on 18 December 2006 it was announced that permanent trading rules for trades between systems will require a seller's allocation of water to be at least equal to the allocation levels that apply in the buyer's system for the remainder of the 2006–07 irrigation season (Goulburn–Murray Water 2006b). Trade out of the Goulburn into the Murray was probably accelerated to take advantage of the difference in allocations before unbundling.

### Community action

Community leaders in irrigation areas most affected by the potential for stranded assets are starting to look beyond government as the means of salvation for the community values they prize. Although still lobbying for controls on the permanent water trade, they are also establishing what they see as a safety net:

*The whole concept of the community water bank is to try and hold permanent water in our district. We want to allow younger people to come into farming; we want to give them a chance to start. A lot of them are finding now that when they want to buy a farm the water has been stripped off it and they can't afford to buy the water as well. So we are trying to set up a system that allows them to buy the farm and then, perhaps through a longer-term lease–buy arrangement give them the water to get them going. In the future we might want some sort of set up where say if I'm ready to retire I might be happy to lodge a couple of hundred megs with the water bank—hang onto it as a capital investment and let them sell it temporarily or lease it out or whatever. I might be happy to do that if, for example, I eventually sell the farm to someone that doesn't want anywhere near as much water as I've been using or if we have a change of direction from permanent pasture just to summer crops. In those situations I might be happy to hike some water in the water bank. So might Joe Bloggs down the street or maybe the local milk factory or the local milk bar or any of the local businesses. It might be ordinary mums and dads with a few hundred dollars to invest for the kids. They might want to invest it in the water bank because all that money will be secured by a megalitre of water. We're just sort of floating it out there now. We've been doing a bit of work with a solicitor, pro bono, to get the vehicle set up to do it right across the north.*

One government employee cast an interesting perspective on the move to create a 'community water bank':

*I think the thing that might make it work is that it gives the people who would like to sell a going concern an opportunity to reduce the arbitrage between what they would like to do and what a 'rational' investor might do. I think a lot of people would wear a bit of a discount on realising the full value of their assets if they felt they were doing something positive for their community. It might give those people a bit of a halfway house between doing what they think is the right thing by their community and being made to look like fools by people with an eye for a bargain.*

## Managed investment schemes

People are very sceptical about the growing involvement of managed investment schemes in irrigated agriculture. They see it as the taxation system distorting the markets for land and water:

*Those management investment schemes are a whole other issue. They're getting big tax advantages compared with the rest of us. If I had the tax advantages they've got, I'd be laughing.*

*One of the big issues that people see—and I support this—is that it's not pure market forces that are in operation. The people that have the money to buy the bulk of the water downstream from here are MISs and they are gaining tax incentives and capital from places we cannot access. So it's not trading apples with apples; it's not a level playing field. And there is a very strong resistance to the idea of people owning water who don't have land. Again, I'm less than convinced that that's a big issue because if you are going to make money out of water someone's got to buy it. And we are going to be the bunnies who are going to buy it and if we are not willing to pay the big price they think they are going to get for it, well, they will have to drop the price.*

## Irrigators' views

### Perceived benefits of water trading

Irrigators in Rochester, Central Goulburn and Kerang–Cohuna see benefits of water trading arising in a number of areas—business growth, capital productivity, security, opportunistic cropping, liability, cash flow and debt management, and drought management.

### Business growth

Irrigators have been able to increase the size of their business by buying more water. Until recently they have expanded their business by buying neighbouring properties complete

with water: they have not actually had to enter the water market. This is still the preference of many of the irrigators who were interviewed, but the market dynamics are changing. Increasingly, irrigators are faced with the prospect of buying a property that has been stripped of its water and then having to buy the water separately:

*We disagree with the whole concept of permanent trade, but we're in the process of taking over my family's farm, so we have to deal with the way the world is, not the way we would like it to be. Our farm's not big enough for the long term, and the farm we've just bought has had most of its water sold off, so we are going to have to buy permanent water.*

*Water trade's been critical for our business. As we've bought extra farms, even when they still had their full water right, we've asked ourselves, 'What's the optimum amount of water for this property? How much should we hold permanently? How much should we be looking to buy on the temporary market?'*

*We have just bought another 140 acres, which was dry, so we're going to have to buy water to keep up our plans to expand. With the trade there, you have no alternative. You've got to enter the market and take advantage of it where you can, to keep your business going. We've been buying at up to \$1100 a megalitre, but at the moment it's trading around the 2000 mark. At that price, I'm out of the market. I don't think that dairy farmers can justify it at that price.*

### Capital productivity

Water trading allows farmers to make conscious decisions about how much capital they invest in water. As one farm management consultant put it:

*I'd say 20 per cent of dairy farmers at the outside, probably less, are involved in the permanent market and they are nearly all buyers; a few of them are sellers particularly this year. The 'opportunity cost of capital' versus interest arguments are becoming more understood.*



*So \$1000 per megalitre today at 8 per cent interest; it owes you \$80 a megalitre per year ... If the water itself costs \$40 you can pay \$120 for temporary water and you are no worse off, other than the risk aspect, and farmers increasingly understand that argument. We had a client last week that had an offer to buy 400 megalitres of his water at \$2100, and he was very seriously considering that. That's \$800 000 you can do something else with. So at the very least you can reduce debt at 9 per cent. That's not a bad return. Plus the capital gain, which is pre-1985, so tax is not an issue.*

One irrigator commented:

*In the old days we had a set number of megalitres of water right and we just accepted that that was what we had and we lived within it. Once permanent trade became possible, we started thinking, 'Well, just how much more could we get out of this property?' We started to ask ourselves, 'What is the best amount of water to hold?' We had been thinking about buying another farm, but in the end we figured we were better off just buying water instead.*

*I don't think we would still be farming here if we hadn't been able to buy in extra water.*

Water trading also frees farmers up to consider how much of their capital portfolio should be tied up in farming:

*We bought 50 megs not last year but the year before, 2004. There are financial benefits, yes, because this year, with the lower allocation, we have less we have to buy. There are disbenefits: under the new tariff we'll be contributing more generously than others to the running of the system. But on a capital basis it's amazing. We paid \$900 for it and it's now selling at \$1800 a meg. Again, the benefits are much greater than the costs, and as a security thing—we are averse to risk—we prefer to know how much water we are going to need and we like to have as much shored up as possible. Other people have made decisions and said to us you could have put that money somewhere else for a better return, but I think*

*at this stage we probably couldn't. The capital gain in three years; nowhere else you could have done that ... We won't be buying any more permanent water I'm fairly confident, but at the moment at \$400 a meg for temporary water it's cheaper to buy permanent water and pay interest only ... We worked out that if you went into the market now and bought 100megs at \$2000—yeah, there's some for sale at those figures—so that's \$200 000 and then the interest on that is, say, talking \$20 000 a year, and if you held it for three years that's \$60 000. And if you had to buy water at \$400 a meg this year and next year you would come out ahead. Well, I think we are nearly getting to the stage where next year's allocation can't look nice ... The amount of permanent water sold out of Kerang–Cohuna is less than the amount bought in on the temporary market; we traded in more than we sold. So Kerang–Cohuna is a very strong area for that; even though people have somehow decided they wanted to free up their capital by selling their permanent water they haven't necessarily changed their enterprise. And because of that, because it's strong, because people have obviously worked out how to use the temporary market pretty well, the irrigation industry in this community is very strong.*

## Security

Many farmers derive peace of mind from knowing they have enough water to meet their needs:

*One of the benefits of buying permanent water is that you don't have to worry about all the hassles of buying temporary water. Permanent trade means you don't have to live with the stress of—something which gets discussed here literally every day, every single day—what are we going to do about water? But the problem is can we get enough benefit out of paying 1200–1300 bucks a meg at our stage in life? If we were 30, with all that get-up-and-go that we had at 30 ... which is why we have a farm ... why we have three properties now, because we did have it. It's just wearing thin now.*

### Opportunistic cropping

Mixed farmers in Rochester respond to the price of temporary water in the same way as their counterparts in Pyramid–Boort. When water is cheap they use it to grow crops or annual pastures. When water is dear—that is, when the market price is higher than what they could earn by irrigating—they sell it to dairy farmers or horticulturists.

Mixed farming is the buffer in the Victorian water industry. It allows full use of consumptive resources each year, but it also reduces the risk that the dairy and horticultural industries will run short of water.

### Liquidity

Water can be sold rapidly—with minimal advertising costs and very low transaction costs—virtually anywhere in the southern connected Murray–Darling Basin. There are willing buyers and sellers at all times. It is highly probable that the next trade will be executed at a price equal to that of the last one. Water is a very liquid asset.

It is this liquidity that is changing the dynamics of consolidation in the irrigation districts. People leaving farming no longer have to rely on the comparatively thin real estate market to realise the value of their remaining assets. Nor do they have to offload their assets at fire-sale prices.

Of course, some people can only envisage selling their farm as a going concern. For them, doing so validates their life's work. It also puts them in the relatively thin real estate market, which is best inhabited by those wanting to consolidate their holdings. But it is also an invitation, for people with an eye for a bargain, to buy the property and sell the water separately.

### Cash flow management

The temporary market offers irrigators the potential to generate extra cash flow. In the current drought, with seasonal allocations being low, many farmers in the Rochester, Central Goulburn and Kerang–Cohuna region see their returns being

higher if they sell their water on the temporary market. A farm management consultant said:

*On the odd occasion you do get even dairy farmers selling water on the temporary market. There are people considering [selling], or there have been people who have sold, temporary water this year. Farmers increasingly understand the opportunity cost of capital. So, with temporary water on the Goulburn system at \$650 a megalitre, no one can profitably grow pasture at that price. So you say, well, you have 60 megs left: if you sell it at \$650 a megalitre you can buy a large amount of feed or invest at 8 per cent. It's a pretty simple argument.*

One dairy farmer who was interviewed remarked, 'Our business is geared on water. It's all dependent on the return from the product we make, which is milk, and the price of the water, and the relative value of other feed stuffs. So if hay and grain were cheap as chips and water was dear, we'd buy hay and grain'.

### Debt management

The water market offers irrigators the potential to manage their debt. But people's attitude to risk is generally asymmetric: they are prepared to gamble more recklessly in order to avoid a loss than to achieve a gain.

Some irrigators with high debt levels have found water trading useful for returning their situation to equilibrium. Others have found it part of the process that leads to the end of their role in farming:

*I'm a bit worried, seeing as how we are in the middle of a drought. I'm a bit worried that the financial institutions are going to start putting pressure on people to sell their water to get themselves out of trouble. People say, 'The banks wouldn't do that. It's worth more to have the property with the water still on'. But a bank doesn't give a bugger if the water is sold off as long they've got no exposure to the risk any more.*

*I think there has been a lot of people who've been able to get out with a bit of dignity as a result of water trade. They are a lot better off than they would otherwise have been.*

## Drought management

Water trade has made a big difference to the way farmers go about the business of drought management:

*Temporary water trading has made it so much easier to deal with the year-to-year minor discrepancies in the demand. We don't use the same amount each year because of seasonal changes but do irrigate the same area and produce the same amount of grass every year. In 2002 we used 930 megs which is miles above any other year—nearly 100 megs more—and that was simply a climatic or weather thing. There was no rain, and this year looks like being similar.*

*Water trade has allowed us to maintain our productivity through the drought. I don't know what we would have done without it.*

Irrigators must judge the optimum permanent water holding for their properties. They do this in contemplation of the risk of having very low seasonal allocations in the future. They must also make judgments about who else is going to be in the market at different levels of seasonal allocation:

*The dairy industry has started to see itself in the pecking order. You've got orchardists, who should be able to pay more for permanent water than dairy farmers because they can actually get better value out of it. Say, in the Goulburn system we've got 10 per cent water use to horticulture, 60 per cent to dairy farmers, 30 per cent grazing and cropping, and a lot of that ends up in the dairy industry as well. So logically that's the first target—the water from grazing and cropping. But the dairy industry has a long tail of very inefficient water users.*

*We have friends who sold large amounts of their permanent water three or four years ago to free up capital for various reasons. How are they feeling now? Well, they are a little bit stressed because they haven't got any water and it's so difficult to get at the moment. So on average those things are all right. Nine years out of 10 is the theory. But this year a few people have come undone because they are willing to pay a lot of money for it but finding it really difficult to actually source water.*

## Perceived costs of water trading

Irrigators in Rochester, Central Goulburn and Kerang–Cohuna see costs of water trading arising in a number of areas—stranded assets, depopulation, the collapse of an integrated system, effects on the water table, institutional risks, and the build-up of pest plants and animals.

### Stranded assets

As water moves out of irrigation districts, the delivery infrastructure becomes an under-used asset. These 'stranded assets' increase the annual costs for remaining irrigators. They were the number one concern for all the irrigators interviewed for this study.

Most, but not all, of the irrigators interviewed were strongly opposed in principle to the concept of permanent water trading—particularly permanent trading out of irrigation districts. They saw this as the single greatest threat to the future of their district. Most were strongly supportive of the principle and practice of temporary trading.

The recent tariff changes designed to protect the revenue base were generally seen as positive. Irrigators could also see the sense in thinking through reconfiguration plans. These were seen as introducing some uncertainty about the future, but the level of uncertainty was relatively low in Rochester and Central Goulburn:

*Uncertainty is a bigger issue in districts like Torrumbarry and Pyramid than it is in districts like Central Goulburn and Rochester. Torrumbarry and Pyramid are out on the end of schemes. I'm comfortable with reconfiguration in Rochester simply because our major carriers, our major offtakes, will always be there. Sure we may have some ends of channels or spurs where we might pipe off that channel or close down that spur altogether, but they're not major, they're just tinkering around right at the ends—which we probably should be looking at doing irrespective of reconfiguration plans. At the moment I think it is a different issue for us compared to those other districts.*

*There's been an awful lot of water traded out of here in the last couple of years, but at this stage I can't see them making big changes to the channel system.*

And it is not just the effect on annual charges that bothers the remaining irrigators. They are also upset by the loss of visual amenity and the effect that has on community optimism:

*There are people here in particular areas that sold out their water and sold their land or sold their land and the water has been taken off ... There are reasonably strong pockets in Koondrook and Murrabit where there is dryland. It's no longer farmed basically ... It's perceived as a problem by a lot of people. There is an element of community optimism that is based on productive-looking landscapes, and the neighbours of those areas find it concerning because it possibly undervalues or devalues their own property. And, in general, land value has probably gone down as water's gone up. It's had an effect on smaller communities, where the tennis and cricket club and fire brigade are all that exist; it's just that sense that people are exiting.*

## Depopulation

Many irrigators worry that permanent trading out of their irrigation areas will reduce employment opportunities and therefore cause people to move elsewhere: 'Permanent trade

out of irrigation areas—even if you can protect the assets of the irrigation community through the tariff changes—is still going to affect the local community. I don't know if you've read the report done by Farmanco for the Campaspe district: we lose one job for every 95 megalitres leaving the area'.

Most irrigators interviewed for this project were very concerned about the flow-on effects the water trade would have on schools, small businesses and sporting clubs. Others talked about positive demographic changes they see as a by-product of farm consolidation and the associated water trade:

*Soon after we moved here I took one of our vehicles to the mechanic, and he had a go at me: 'I hate it when blokes like you start buying up farms and driving my business away'. But a year or so later he quietly conceded that the people who'd moved into the houses we bought generally had two cars, whereas the mostly older couples that we'd bought from tended only to have one car. So, if anything, we'd helped his business. It's the same with the schools: most of the people who'd sold up were 'empty nesters' and the people who moved into the houses mostly had young families. The school numbers are looking better than they have for quite a while.*

## The collapse of an integrated system

There is a general sense of grieving for what many see as the imminent collapse of highly integrated primary and secondary industries. The interdependence of milk factories and dairy farms is a good example:

*The whole thing was originally set up as an integrated system. You had supply channels, water rights tied to the land along the channel (they justified the channel and made the running of the channel viable), service businesses (mechanics, whatever) sprang up around those farms, but most importantly the processing industries were set up to process fruit or milk reasonably locally. Now a massive amount of water from the Goulburn system has moved downstream of Echuca, and the people in Tatura Milk Products are beside themselves about where the*

*milk is going to come from. And it's only five years ago that dairy farmers would do all sorts of things to become suppliers to that company. A friend was showing me in that area a 5-mile strip of road where there were only two functioning irrigation farms left. And it is such beautiful country. So much effort went into making sure that the whole integrated system centred on the best soils close to where the water was harvested. Now the water is going hundreds of kilometres away from the storages to areas of poor soils, and then the produce is being transported miles back to the processing works.*

### Effects on the water table

Irrigators in Kerang–Cohuna are mindful that permanently high water tables in their areas require careful management. Increasing or decreasing the amount of irrigation in an area can either increase or decrease land salinisation.

Stopping irrigation can remove vegetative cover. Lack of vegetative cover on the soil surface can cause salty water to rise to the surface through capillary action, and when the water evaporates it leaves the salt behind:

*I think salinity may ultimately be an issue. The hydrology of the water table around here is that the water table is less than a metre everywhere you go and, if it's dry, evaporation and transpiration bring it up. But I haven't actually seen that happen. One farmer sold five years ago, four years ago, and that farm sat dormant for three years. Eventually it was bought by another farmer, and now it is fully occupied.*

Increasing irrigation can increase pressure in the groundwater system responsible for the water table. In low-lying areas this can bring salty water to the surface:

*Just across the corner here is a farm that hadn't been irrigated for some time. He's now irrigating and producing really good pasture from it, so it's obviously aesthetically better, looks productive, but probably from a water table point of view it's not a good thing—putting more pressure on the water table here. But it's well drained in this area, so it's really not a big issue.*

### Institutional risks

In the light of the market disruptions caused by mid-season reductions in New South Wales allocations, many irrigators are concerned about the security and integrity of the trading system: 'Private brokers need to be accredited and have auditing of their trust funds. Some of them don't even have trust funds. There needs to be some formal approval process for them and investigation into what they are doing'.

### The build-up of pest plants and animals

Agricultural land that is being managed neither for irrigation nor for dryland farming has a higher incidence of pest plants and animals. This increases the inoculum potential for neighbouring properties:

*The biggest problem with the place that I'm trying to buy is that he's gone out of dairying. He's sold off the bigger percentage of his water, so he's probably got his money, but bloody noxious weeds and thistles ... they've become a bloody nuisance. I look at all the dry blocks around me—they don't worry about cutting their thistles any more—and, as an adjoining neighbour, it's a bloody disaster.*

### Cognitive dissonance in the irrigation community

Cognitive dissonance is the uncomfortable tension that comes from holding two conflicting thoughts at the same time. The theory of cognitive dissonance sees those contradictory thoughts serving as a driving force that compels the mind to acquire or invent new thoughts or beliefs or to modify existing beliefs, so as to reduce the amount of dissonance (conflict) between attitudes, emotions, beliefs or behaviours. In the extreme, people's mental health can depend on their being able to reduce the conflict between those different thoughts.



### *Wanting to expand **and** maintain the community*

Many of the irrigators interviewed have conflicting emotions about the depopulation of rural areas. They speak with a sense of loss about the demise of the local footy club or the dwindling numbers at the local school, but in the next breath they speak, with justifiable pride, about the way they have survived in farming and how they have managed to build up their holding of land and water by buying out other farmers. Some even speak of their ambition to buy more farms.

### *Empathy for those in trouble but disdain for those who do not sell a 'going concern'*

Irrigators are reconciled to the continuing amalgamation of properties. They know this means fewer farmers and thus fewer people in the area and fewer children in the schools. Accordingly, irrigation communities rail against what they see to be the underlying reasons for people feeling they need to sell, but at the same time they hold deep sympathy for community members who can no longer continue farming. There but for Fortune go we.

Property amalgamation is a familiar, if somewhat discomfiting, part of the farming scene. The exit is mourned, and the purchase is made as dignified as possible.

The change is understood to be an opportunity for neighbours as much as a loss for the community. No one can begrudge the purchaser their gain. Rather, there is almost a sense of noble obligation surrounding the purchase: someone must keep up the good fight.

Separating the sale of land and water changes this dynamic. It opens the possibility that the vendor will, in effect, cause irrigation to cease on that property. This, in turn, will bring about a net reduction in irrigation in the local area.

### *Wanting to sell a going concern but mindful that the buyer might separate water and land*

The ability to sell water separately from land creates a tension in many people's minds. Most people feel that selling their farm as a going concern would be a validation of their years of hard work, but they also realise that the total value of their land and water might be greater if the land and the water are sold separately:

*If you were a 60-year-old farmer with a small farm and you were looking to retire, but you couldn't get the money you wanted because no one wanted to buy the farm as a going concern, you'd think to yourself, 'I've been given an out' ... They'd think, 'I ought to be able to sell the farm with the water on it for half a million dollars, but I can't even get anyone to look at it. But if I were to subdivide, I'd get a couple of hundred thousand dollars for the house. I might have \$300 000 worth of water on it. I can sell that, so I've got another \$300 000. I've got a neighbour who doesn't mind buying the land without water, so I might get another bloody \$300 000'. All of a sudden, they've packed up shop and moved into town with an additional \$200 000 in their pockets. I'm realistic about this: if you were up to retiring age why wouldn't you look at it? You can't blame them. That's the system. And the system allows them to do it. So you can't be too bloody critical of the ones that are trying to get out, and, as you know, the average age of farmers is pretty high.*

*We're waiting to see whether our son wants to come back on the farm. If he doesn't we'll sell up in a few years. There are only three other farms on this channel, so if we sold the water separately we know that would put the rest of them at risk. On the other hand, if we sell the water with the farm, whoever buys it might sell the water off anyway ... It's a lovely view out there ... Anyway, we don't have to worry about all that for now. We'll see what our son wants to do first.*

## Community views in Rochester

Rochester is on the Campaspe River, 180 kilometres north of Melbourne, 28 kilometres south of Echuca and 63 kilometres north of Bendigo. The town is in Campaspe Shire, which is based in Echuca, and is the main service centre for a diverse agricultural region in the central part of the shire. At the 2001 census there were 8216 people living in the Campaspe–Rochester Statistical Local Area, 2600 of whom were living in the town of Rochester. A focus group was held in Rochester with a cross-section of community residents, and interviews were conducted with some local residents, as well as some key people in Echuca.

### Economic profile

Dairying is the main industry in the district, but there are also grapes, tomatoes, cattle and sheep production, and cropping. Rochester is the centre for a long-established farming community; it has several heritage-listed buildings and provides a range of retail, business, community and recreational services. Among the associated agricultural industries are Murray–Goulburn, Lely Australia, Humes CSR, Nelson Manufacturing, and the Rochester and Elmore Consolidated Herd Improvement Service. The Murray–Goulburn dairy processing factory is the largest employer, and there are several other smaller industries involved in concrete production, agricultural machinery and manufacturing. Lely Australia is an international company based in Rochester; it distributes dairying and fodder conservation equipment, plus robotic milking systems.

### Community services

Rochester has private and government schools and a district health service, including a hospital and a neighbourhood centre. The hospital is undergoing a \$21 million upgrade, which, among other things, involves the development of a new operating theatre. There are new doctors' rooms,

a nursing home, and hostel and aged care facilities. There are doctors, a chemist, a dental surgery, four banks, six churches, three hotels, a tavern, and various community and sporting facilities such as a bowling club, two golf courses, a motorsports complex and a swimming pool.

### Community profile

Figure C.4 summarises the community profile of the Campaspe–Rochester Statistical Local Area.

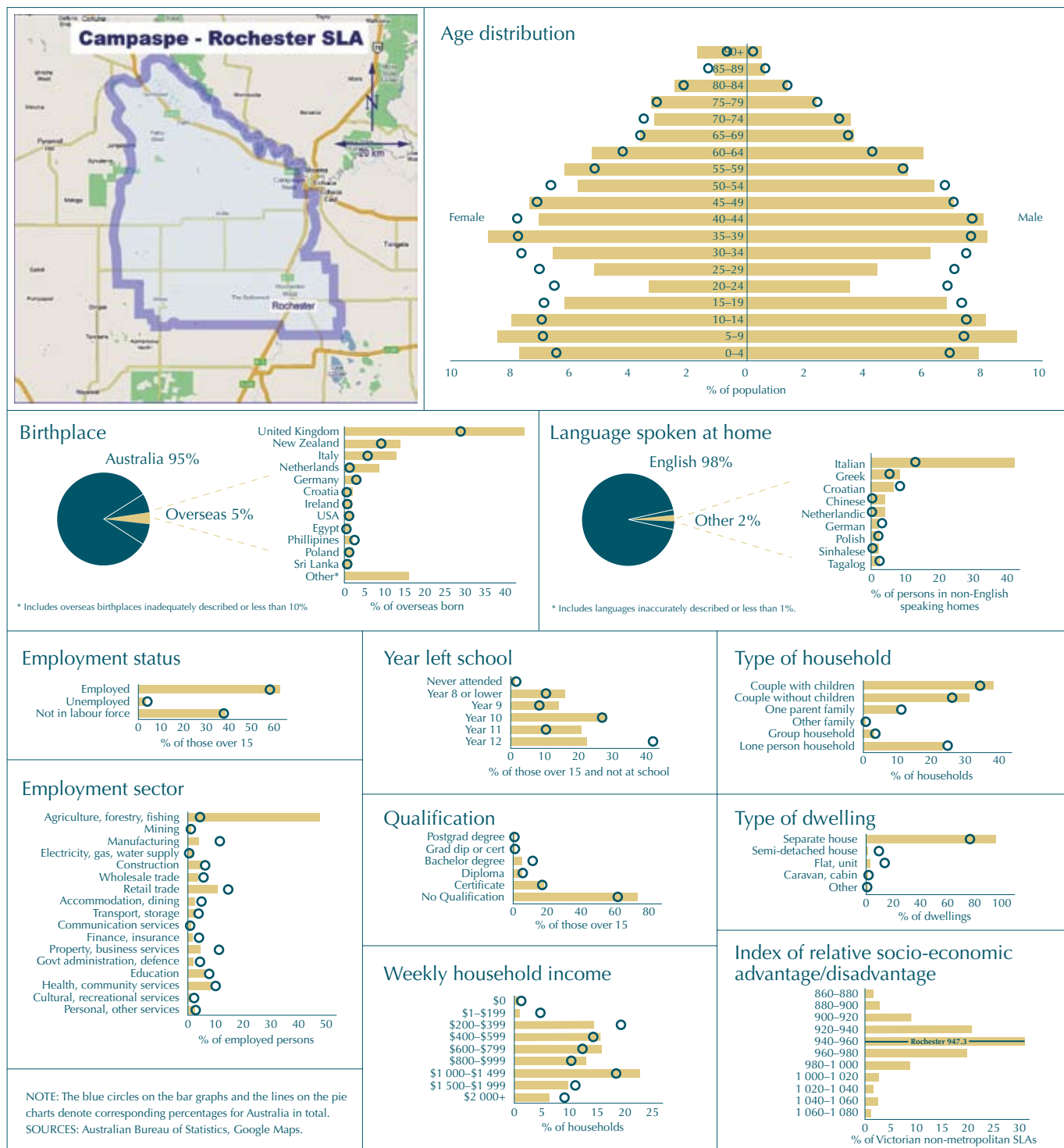
### Community strengths

Rochester is a typical small farming community, displaying a strong sense of community pride and with a long history and a high level of social cohesion and organisation. Project participants talked about the amenities of the place but they also emphasised the strength and support of the people in the community as Rochester's greatest asset. One said, 'The facilities, the amenities, you have everything here, great young people, good schools. People come here and set up business, and even if they leave that business they stay on. The proximity is great. Echuca is 20 minutes away, Bendigo is 40 minutes'.

The diversity of the local agricultural industries was seen as a major strength:

*If the dairy farmers had a bad year, the wheat farmers had a good year, and if the tomato farmers had a good year, someone else would have a bad year. We are very diverse; we don't rely on one thing. I have been told that the ANZ bank here was the only country branch that funded itself. In other words, it had deposits in that bank that equalled the loans it had out. Even when other banks were closing down we still had a National and a Westpac bank. The secondary college is up to 550 kids this year. It's not an old town; it's a young town. The pre-school needs a bigger school with more classes.*

Figure C.4 Campaspe–Rochester Statistical Local Area: community profile



## Community cohesion

Persistent lobbying by the community led to the Victorian Government granting the \$21 million to redevelop the health facilities, doctors' rooms, community health services and hospital. The community reacted strongly to the closure of the hospital's operating theatre. More than 1000 people turned out to a community protest meeting because they feared they would lose their hospital, doctors and health services. All the project participants referred to this as an example of the cohesiveness of the community.

The local neighbourhood centre was cited as a further example of community cohesion. Residents had recently petitioned for a 'men's shed' to provide a facility for men to socialise. The shire provided a building for a neighbourhood centre to cater for a wide range of community groups, and at the rear a shed provides woodworking equipment, tools and other things so that men can meet and work together.

One of the local farmers gave an example of the supportiveness of the community:

*I think it's a vibrant community. It fights very hard for what it really needs—like the hospital. And one of the nicest things about Rochester is that you will always be supported in a crisis. If that involves being away from your community you really appreciate it when you come back. Our eldest son was diagnosed with a serious disease when he was young, and that's when we learnt what it was like to be in a community like Rochester. In Melbourne, people don't know their neighbours. We came home and someone had done the ironing and looked after the dogs, and the fridge was full for weeks on end. We left in the middle of shearing because we had to get to Melbourne quickly, and the shearers that normally abide by every rule and are pretty fixed on what they do, were shedding sheep and doing things because we weren't here.*

Farmers also talked about support between neighbours:

*There are some great young people. Our sons have a network they have built up of more young people than we expected to know in the district. There's nothing formal about this; it's all mates and friends but, as my son says, what they did without mobile phones he will never know. If one has heard of a good contract going on grains or hay or something, they will be on the phone and they will all know about it.*

## Community problems

Crime was not a concern for this community. The local police explained that the community was conservative and that very few problems occurred. The challenges for the Rochester community arise mainly from the town's small size and its inability to maintain local industries and services. A local bank manager explained that one of the difficulties for the community was over-reliance on agricultural industries for business and employment. Most bank agribusiness is now managed by regional offices, leaving local bank branches to operate only as an agency. She added, 'Ten years ago this was a leading bank. The majority of our day-to-day customers are retired people, but it's still important to provide a service to the area. People like to come in and see someone'.

The main concern is the loss of water from the region. One farmer commented:

*Surviving the loss of water is really one of the major problems. Since the amalgamation of councils, I think we have to battle even harder to get recognition for roads and services. Really it's just keeping our business centre going, because if we lose that we are just going to have to travel so much further.*

Another mentioned that in one of the smaller communities in the area a one and a half-teacher school is likely to close because of the loss of farm families from the district: 'It's a concentrated dairying area; the only thing that will keep that school open is hobby farmers that buy out dairy farmers when they can no longer go on'.

## The impacts of water trading on the farming community

The focus group and the interviews with residents revealed four major concerns about water trading for local farmers—stranded assets, uncertainty about future water allocation, the changing rules and regulations for trading, and the inability of local farmers to compete with large corporations for water. One of the farmers said:

*Water trade is here to stay there is no doubt about that. We've had 2000 megs of water taken out of our district in the last three weeks, although they say it's not a big issue: the net trade out of the whole Rochester area at the moment is less than 1 per cent. For the first few years of water trading, even though there was a little bit of water going out overall we were a net importer of water. I think we even increased. People who had 100 per cent of water right said that wasn't enough for them to run a dairy farm efficiently, and over a period of time people developed their farms on no less than 150 per cent of water right. What water trading gave them the opportunity to do was shore up their security by buying more permanent water in. If you had 100 meg and you were only going to get 50 per cent of that 100 meg people couldn't survive, but if you had 200 meg and were only going to get 50 per cent of that 200 meg you could survive. I'm not sure why it turned around and now we are an exporter. The mighty dollar rules these days.*

Another explained:

*The west side of the Campaspe system is an area known as the Rural Finance, which developed in the 1960s. There used to be about 80-odd dairy farmers out there and now there is only 18 or 20. Because the majority of people have sold their water off, it has brought it back to the very minimum number of people that are now responsible for maintaining the system. In the rural finance area, some of those channels have had it now because the water has been sold. So how viable is it to*

*run the water to the guy down the road? The trouble is once you do that damage how do you change it? I would think that in a very short period of time there will have to be some serious discussion go on as to whether that system remains at all.*

A representative of local industry observed, 'Farmers are very, very concerned that they won't be able to afford the water because the large corporations will have lots of money for developing country, growing crops with a high return, and your average dairy farmer isn't going to be able to compete'.

Concern about stranded assets in the area was also evident. One participant believed stranded assets were self-propelling, in that, once more than two farmers sell water on a channel, others feel the pressure to follow:

*The problem on the open system where you might have a spur channel with three or four irrigators on it, and if two or three of those irrigators decide to sell, are the business people going to start saying, 'Is it viable to send water down this channel to that person?' It puts those remaining in a bind to sell as well to get out while they can.*

Another added:

*The other big issue that I would like to bring up is 'higher value'. OK, water has to be traded to its higher value. What Mildura—where they are letting the grapes rot on the vines, oranges are dropping on the ground—that's higher value? Or is it our managed investment funds, is that higher value. Oh, my word it is. Now I heard yesterday that one of the almond plantations are stockpiling water on land wherever they can because the tagging comes in with unbundling. Once it's tagged if we on the Goulburn system are only on 23 per cent, they can only use 23 per cent, but it's certainly advantaging the Murray system farmers, whereby they buy 100 per cent of the water here. You have zero off Campaspe and they take it into the Murray System and they get their full water right. Now how fair is that?*



One of the farmers added, 'I think it needs to go to reliability as well'.

Another participant commented:

*Initially, when water trading was brought onto the scene I didn't think it was a bad thing. Water trading in its own right I thought was OK, but the restrictions that we had on water trading were far too open and they were wrong. There is some very marginal land in the Pyramid Hill area and people were pouring water onto that land in the hope that something would grow. I think that was just a waste of a valuable resource. I didn't have an issue with the Pyramid Hill people when they had marginal land like that being able to sell their water and perhaps bring it back into the Rochester area, but at least it remained on the Goulburn system. The unbundling is going to make it much worse again, so from that point of view I don't think that permanent trade in its own right is a bad thing, but the rules are totally wrong.*

He drew attention to drought and water trading:

*I think we really have to differentiate between the drought and what was occurring normally because the drought certainly has fast tracked this incredibly. If we hadn't had hit drought, if there was still water for that Campaspe area, would people have sold their water? So we need to put it into context. The temporary water trade was really good because it allowed it to be moved within districts. Once we have these water barons and managed investment schemes, which create an unfair playing field, they get a 50 per cent tax break etc. They take water from this area where we are paying \$46 a meg and take it up the river to Merbein or one of those places, [where] they are paying \$11 a meg for water that we have to pay \$46 for.*

## The impacts of water trading on the non-farming community

Several of the focus group participants were local business owners. They were asked if water trading had affected their business and about their perceptions of the impact on other businesses in the town.

## The associated industry perspective

Rochester was described as a town that in the past had a strong local economy but where drought and the water trade have had an impact. One participant explained:

*Rochester has been growing now for the last 15 years. The factory at the end of the street [the butter factory] employs a lot of young people who help with the business houses of Rochester. Obviously, there are companies in Rochester who rely heavily on the agricultural industry and they are the ones I would be concerned about.*

He noted, however, that the factory had recently stood down some workers:

*Without that dairy factory, we wouldn't be doing that well. We have young families working at that butter factory, the husbands or the wives, and sometimes both, and they are getting \$50 000–60 000 per year income. Now that's not bad. A lot of young people come into my shop to buy because of that. There are a lot of casuals that they usually put on this time of year. Now I heard that they were not putting any people on, they are actually putting people off.*

A representative of an international company based in Rochester said, 'One of the reasons that we are based in Northern Victoria is that it's one of the biggest dairying regions in Australia. Rochester is a top place, we have great people based here, but if everything is happening elsewhere we will have to shift the expertise elsewhere'.

When asked to isolate the impact of trading from other trends in agriculture, he responded:

*You tend to get bigger equipment, bigger holdings, the mum and dad family farm seems to be a dying trend, which is very bad for areas like this. People depend on the number of families that are out there. I was at a regional dealers' meeting and the major concern was the insecurity caused by water trading and whether the farmers will be able to afford to buy the water and compete in an open market and make a dollar out of it. We sell expensive*

*machinery such as robotic dairies, but its very hard for farmers to make a decision to spend that sort of money when they really don't know what is going to happen next. People are saying, 'If this guy sells the water and I'm over here how much is it going to cost me and what are the implications of getting that water to me when I'm on the end of the line?' I talk to families and they are saying, 'How long is this going to last?'*

When asked if the cause was drought or the water trade, he responded:

*Well, they were talking more so about water trading and the future—whether they could afford to pay the money for the water and whether the water would be available. It's the uncertainty. It's very difficult not to get the drought and trade mixed up, because we are in a shocking set of circumstances. We were going all right until it stopped raining.*

### *The central business area*

The owner of an electrical business reflected businesses' concern about the downturn in the local economy:

*September was the worst month we have ever had in my shop in 30 years. The Rural Finance farmers were buying things out of my shop on a regular basis. In the late '70s the area out there was booming; there were about 100 farms out there. I can remember in '82, and I think it was drought then, we sold two to three airconditioners a week out there. One farmer would get one, then the next door neighbour would get one, because they had the money.*

*We were also servicing their dairy equipment. It started to slow down a few years ago, and I can't remember seeing a dairy farmer from that area coming into my shop and buying things that weren't a necessity. We haven't hit a brick wall yet, but we have to be very careful. The best way for us to manage this is to control the amount of stock we bring in.*

When asked how much of the downturn could be attributed to the water trade, he replied that, while there were fewer farmers around, it was difficult to disentangle the effects of the trade and drought:

*One of the positives of the area has been the grapes down the road because they are labour intensive. For nine months of the year there are people employed out there and they use a relatively small amount of water for what they do. They can pay a lot of money for a megalitre of water because they are going to get a return from it. Plus if you have \$3 million of grapes in the paddock and if you have to spend \$50 000 to save them, you will. Drought-wise we are all affected. One of my staff is pregnant, and you think that's great, that's one less. We had a guy leave last week and in the past you would have automatically put someone on, but we are thinking about it. What is happening now is definitely drought related and it changes your whole tack: you look for better bargains. I don't know if we can understand the impact of water trade on our business. You can relate it to drought and six out of the last 10 years it's been terrible. If it rains at the right time of year, the week after that rain it is just incredible what happens at work, the number of people that walk into the shop and start buying things.*

*There are probably a lot of businesses in Rochester that don't understand water trading—don't want to know about it and don't understand it. Everyone says when the rains come everything will return to normal. Unfortunately, that won't happen because the effect of water trading will start to dig in. There's no doubt a town like Rochester relies on the farming community. If the farmers have money they spend it and everybody benefits from it. As soon as things go bad the farmer shuts up shop and everybody feels the effect. Last year was a really good year in the dairy industry. So I would be concerned that if it was a really good year for farmers that business has been slowing down over two or three years; 39 per cent water for the Campaspe area, 31 per cent the next year and zero this year, so I think there may be a pattern.*

Loss of permanent water from regions has caused concern for local shires because of the significant drop in rate income. A representative of Campaspe Shire reported that this was also a concern in the Campaspe municipality:

*They didn't do any socio-economic studies on the impact of water trading on rural communities prior to it occurring. They have just gone ahead and now we have this juggernaut that just keeps chugging along, irrespective of people being against it. The unbundling of water means a loss of revenue to our shire of \$1.3 million. The Shire of Gannawarra will lose \$800 000, and Mildura I have heard is about \$2 million. I suppose council has got two options—either increase rates or cut services, which the community really won't want. The state government has completely ignored any pleas for assistance. They have given them 12 months' grace to bring in this unbundling and, I think the very words were, 'to adjust'. So money-wise for the councils it is a huge problem, but our main grievance has been that they have gone ahead with this without any well credentialed, good sound practices of a socio-economic impact study, and we can see the impact on our communities already.*

### *The community*

The stringent water allocations within the system have a social consequence for people's gardens and the aesthetic appeal of the town. One farmer displayed her once-beautiful garden, which had been her pride and joy and her source of relaxation. She was struggling to maintain a few plants with grey water from the house and was most anxious about how they would manage with the impending loss of stock and domestic water. One of the focus group participants spoke of the impact for the golf course:

*We also use the Campaspe system to water the golf course, and if there is no water we can't water the course and that's another aspect of the affect on communities. There are less people playing golf because the course is not as good as we would like it to be. We certainly find less people from the Rural Finance playing golf because there are not so many people out there any more.*

*I was asked my point of view about water trading at a meeting and my answer was that I disagreed with permanent water trading because I would hate to see permanent water go from the Campaspe system because it could shut it down and that will affect Rochester businesses. About two days later a lady came into my shop and she swore at me—and this lady is not prone to swearing at the best of times—and told me I had no right to tell her that she couldn't sell her permanent water right. I said that as a business person I'm against selling permanent water rights because it affects our community. She was really distressed about this.*

Another agreed:

*The stress is leading to distress and people are acting in ways that they would not normally act. The government here in Victoria loves to use the term 'willing sellers'. Now what is a willing seller? A person who has got the bank breathing down their neck, has got lots of outstanding debts? Their option is they can sell their water overnight; it might take years to sell their farm. So they sell their water. Now, to me, that is not a willing seller. I think that's a very crass way of making out that people are just voluntarily selling their water. They are not.*



Dairy farmers, Kerang

In a similar study of this region Fenton (2006) found there was considerable social pressure on farmers who chose to sell their permanent water. Eighteen months on, however, with severely reduced water allocations and intensifying drought, participants in the present study maintained that, while the majority of people were against the loss of water from the district, they appreciated that farmers were often forced to sell and they were afforded more sympathy.

One of the farmers interviewed said:

*The selling of permanent water out of the district has been very bad for the district because of the social impacts. I think some people who have sold have been left very isolated from the rest of the community. It's frowned upon. People have been ostracised and isolated if they have done it, and I feel very sorry for them because everyone's economic circumstance is different, and for most people it's been an economic decision. Now there is a greater acceptance, I think....*

*I also think [about] the impacts of water going out of the district's flows because the number of dairy farms closed in this area. It flows through to our business centre—our factory. They have just put off 10 workers in the last few weeks, and I'd say that's only the beginning.*

*I think the costs fall hardest on the young farmers who are trying to establish themselves. They have no spare cash to go out and purchase. And their assets are all tied up. We've only been able to purchase by using our asset as security, we've never had the spare cash for the little bit of water that we have bought. The young farmers aren't in that position.*

## Discussion

Rochester has been an importer of water for many years, but recent trade out of the district, significant reductions in water allocations, and the subsequent loss of productive irrigated agriculture in the district are a major concern for

residents. Structural change is occurring, and residents fear the loss of more people from the area. The existence of dryland agriculture in the region does offer some alternatives, but the current drought has meant that the downturn in the irrigation industries is felt more keenly. It was difficult for project participants to differentiate between the influence of drought and that of the water trade. In short, it can be concluded that the water trade exacerbates the impact of drought. The dairy factory is a big employer in the town, and the lack of water for the dairy industry is affecting it.

There is a feeling of warmth and friendliness throughout the town of Rochester. The residents spoken to displayed a genuine regard for people and an attachment to their community. Of all the communities studied, this appeared the most cohesive, largely as a result of the fact that most of the residents are long-established members of the community and share similar values. There is little need for structured community support services because informal community support is already in operation. This quality represents a special mix of people, community structure and environment that is less common in rural Australia than it was in the past. What threatens Rochester residents is the feeling that the loss of population could lead to the loss of existing community services such as their health services.



Dairy, Central Goulburn



## Community views in Kyabram

Kyabram, an attractive town 39 kilometres from Shepparton, 42 kilometres from Echuca and 200 kilometres north of Melbourne, is situated between the Goulburn, Campaspe and Murray Rivers. A substantial and growing community of 6000 people in the town and a further 16 000 in the surrounding district, it is part of Campaspe Shire, which is based in Echuca. A major local attraction is the Kyabram Fauna Park, a 55-hectare reserve housing 500 species of wildlife.

### Economic profile

Campaspe Shire's second-largest town, Echuca, is an important centre for commerce, industry and employment in the eastern part of the shire. Dairying and fruit orchards are the main industries; manufacturing and engineering are important secondary industries. Processing of fruit (SPC–Ardmona Ltd) and dairy foods has become increasingly important. Nestlé (Tongala), Heinz (Girgarre) and Bonlac (Stanhope) have food processing plants in the district.

### Community services

Kyabram is important for service delivery, particularly health services, in the surrounding rural district. The town has a 46-bed hospital with an attached 30-bed home for the aged, a retirement village, an infant welfare centre, an ambulance, 11 doctors, three dentists, a chiropractor, massage therapists, and practitioners of alternative medicine. There are three primary schools, a secondary college, a community college, and two preschools. There are churches of many denominations, an extensive community centre, a swimming pool, excellent sports facilities, a cinema and a licensed club.

### Community profile

Figure C.5 summarises the community profile of the Campaspe–Kyabram Statistical Local Area.

### Community strengths

The long-established farming district surrounding Kyabram is a wealthy area, and the town reflects this. One project participant said this wealth base is the main strength of the community; he added, 'There is a lot of money in and around Kyabram. Real estate prices are always good. Probably as dear as Shepparton; not as dear as Echuca'. Other participants focused on the facilities in the area. Kyabram was described as a 'big sporting town': 'Its got good schooling and an exceptionally good hospital. Good sporting groups, there's plenty of sport in the town. And probably the easy access to Melbourne'.

### Community cohesion

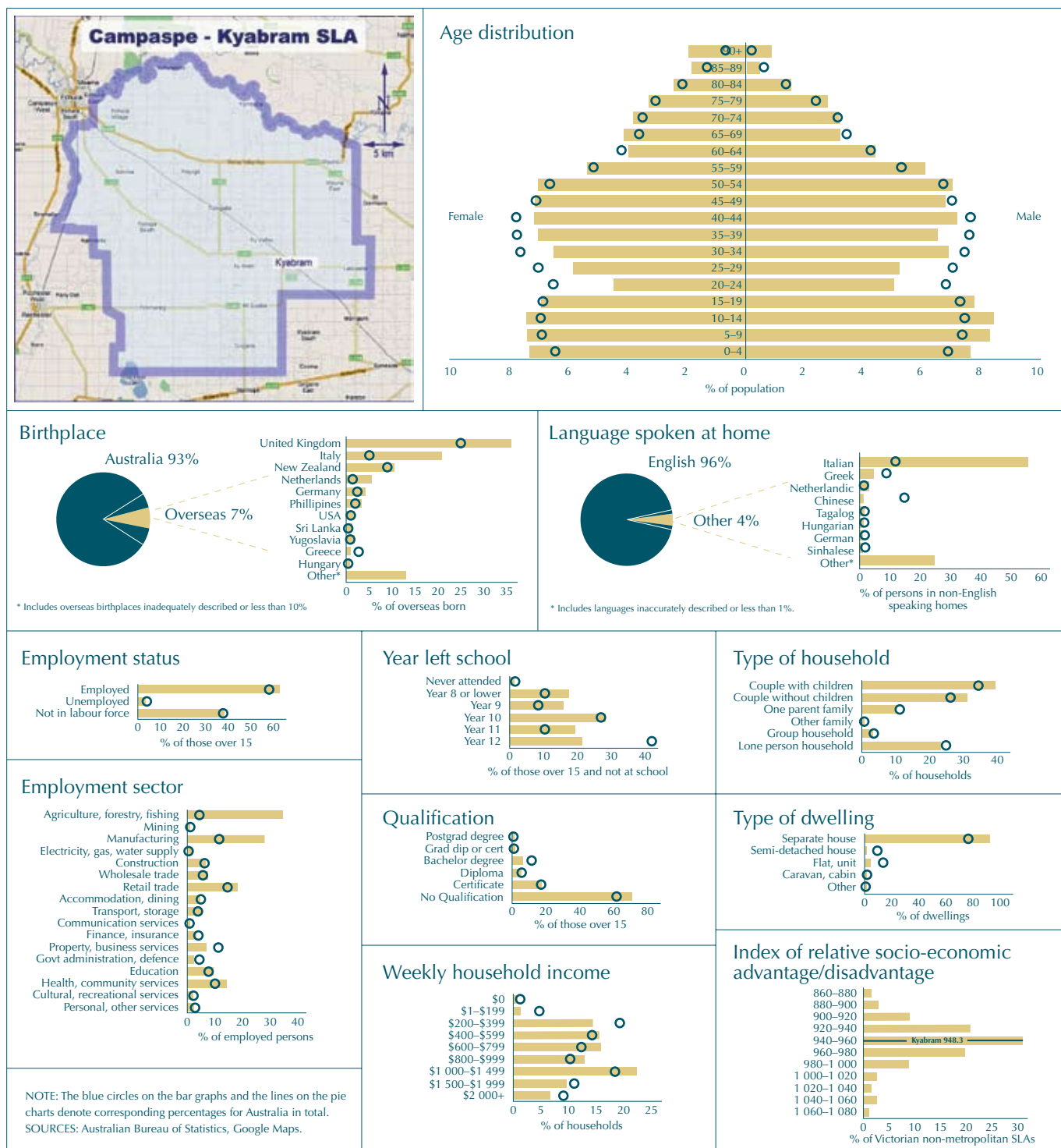
Participants were proud of their community spirit. One said, 'I've travelled around a bit and it's as good as I've seen'. Another said, '... a small, tight-knit community that is very community minded. There are a lot of service groups, and participation is good. Good youth groups and support for people. Churches are very strong. They recently organised a barbeque for farm families as a social outing'. Another participant spoke of community support for a family who had suffered a tragedy, concluding, 'Everyone knows everyone and rallies around when needed'. Another agreed: 'It's a warm and friendly town and is a town that has got where it has without much help. It's a community that works together'. He also noted, however, that some of the non-farming community do not really understand the difficulties the farming community faces: 'They don't realise the seriousness of the water shortages for farmers and how this will ultimately impact upon the local economy. They read about it but don't understand'.

### Community problems

Crime was not a concern in this community. The local police maintained, 'Most folk are decent hard-working people'. The greatest challenges for the Kyabram community are stagnating population growth, loss of young people to bigger



Figure C.5 Campaspe–Kyabram Statistical Local Area: community profile



centres, and lack of employment and opportunities for future economic development. One community leader said, 'Trying to keep the kids employed in the town is the main concern. We lose kids to Melbourne or wherever. But every country town's the same'.

Many of the participants referred to water as the 'big issue'. One participant noted that it pervades every topic of conversation in the community; another maintained that drought is the challenge. Yet another participant qualified this: 'The drought is depressing, but that won't be there forever. Water trade has certainly impacted on the district—not Kyabram as much, but certainly the district, particularly small communities like Tongala'.

## The impacts of water trading on the farming community

A banker provided an overview of the current status of agriculture in the district and the impact of the water trade. Drought has had a big impact on local dairy farms:

*This year is throwing up lots of challenges. Hardest hit are irrigators on the Goulburn system because water allocation is so low. Not to say people on the Murray are not affected. In terms of feed shortages, we have seen panic buying because of the dry conditions. The flow-on effects are far more compressed this time than the previous drought of 2002–03.*

*Feed prices reached record highs in a few weeks and water prices have gone sky high in a very short time frame. It's having a big impact on their cash flow and for next year's outlook and their long-term viability.*

He said the bank had been exceptionally busy reviewing loans and clients' ability to carry debt. People's whole business plans have changed with the water shortages:

*While the Murray guys have 95 per cent water right at the moment, they have budgeted on grain prices of \$200-plus a tonne, and it's now up to \$300-plus. And many are locked into contracts. Often these are farmer-to-farmer contracts, long-term arrangements at mutually acceptable*

*prices between buyer and seller over a long term of association. But those contracts are falling down because growers don't have the crops to sell. So the farmer who had it locked in has to enter the market to replace that grain at current market prices, which are massive. So that is hurting people and causing constant replanning. The big unknown is what will it be like in autumn next year. Are we going to get a break so people can get annual crops and pastures sown? Are we going to return to normal feed prices or will water be short again? There could be a great deal of restructuring that will occur.*

*For the Goulburn guys it's happened very quickly ... and more severely. Their allocation opened up at 7 per cent and increased to 23 per cent, and it is unlikely to get any higher. A lot of people have had to make pretty rapid decisions and change the way they are farming. Those that have debt have had to maintain a level of cash flow to cover their fixed overheads including debt. A lot have cut back cow numbers, scaled back production by around 30 per cent. That has been achieved by parking cows, which is an avenue open to small operators. But the drought is widespread and there are limited options to get rid of cows anywhere now. Other regions are doing it tough. Also, in the last drought a lot of people had negative experiences parking cows because they returned in poor condition. So a lot of people have reacted differently this time around as a result of the emotional and financial baggage they carry from the last drought. We have seen a lot of scaling-down of cow numbers to match it to the amount of grass they can grow. Dairy farms cannot afford to be buying massive amounts of hay and grain to fill the feed gap. Some can more than others. It's really a loss-making year for most dairies.*

Yet he remained optimistic:

*This region has been a long-term food bowl for the country and I am sure it will continue to be so. If water continues to be a scarce resource there will be a fair bit of adjustment to occur with water moving to high-value crops. Horticulture will continue to get a fair cut, and dairies that remain will be those that can extract the most*

efficiency out of the resource. There are still a lot of dairies that are hanging in there, but they are marginal in terms of scale and management ability. If you draw a bell curve, there is a lot at the tail end that will be victims. The industry is contracting at 7 to 8 per cent a year, and events like drought just cause acceleration in the numbers that exit ... continue. I think this drought will push a number of the smaller farmers out of the industry.

Dairying has been an industry with an ageing base, and getting young people into it has been a real challenge. Dairying has been a good cash flow business, but kids are not all that keen to come back on the farm and work as hard as mum and dad. So the parents' retirement will be to sell the farm, and that farm typically, if it is close to a regional centre, is small and is likely to drop out of the system and become a lifestyle block. This is happening a lot in this area. Most of the investors going into dairying don't want a 100-cow farm: they want a 500-cow farm. So they are putting together small farms to create large holdings. That's just the way agriculture is going. So that attrition will continue. And the shortage of water will accelerate that. In the Goulburn system the bulk of water licence holders are small farmers or lifestyle or hobby farmers. There is only a small percentage that has a water entitlement over 300 meg. So while they have only 23 per cent they are not doing a lot with it. As bankers, we are a bit cynical about the latest government assistance in terms of the \$5000. It may cover 75 per cent of those affected, but it's of little benefit to them. On the Goulburn system, many of those small licence holders are sellers in the market. They sell their few megs of water at \$650, and the ones buying are the commercial-scale producers who are making money for the region. It was clearly politically motivated.

A farm adviser had a similar perception of the local industry:

*If you go back to '02–03, irrigation was a bit of a given. That's what we did, and it was taken for granted. Now irrigation has stopped being something you do and water has become another feed input. In late spring '02, temporary water hit \$500 and dairy farmers said, 'We*

*are not paying \$500 for water; we will buy grain or hay at \$350 a tonne and feed our cows that way rather than buy water'. As demand dropped off, the water price came back to \$380 a meg and the dairy farmers said, 'At \$380 a meg, I'm probably better off buying water than buying hay at \$400 or grain at \$380 a tonne'. And, of course, the price went back to \$500. The key outcome was that farmers looked at water quite rationally. In tough years they are saying, 'OK, to produce milk I can feed them pasture or grain or hay or any combination. I need to lower input costs. If water is there at \$650, I'm not going to enter the market. If it comes back to \$300–400, we will go back in'.*

*I think this is how farmers should look at it. In these drought years they are not going to make money whatever they do. It's all about minimising loss. When water is reasonably priced, irrigated pasture is their cheapest form of feed. It's what they know and what they are good at and what they do.*

*After '02–03 farmers went two ways. Half sold a lot of stock and dropped their stocking rate right back to do a better job with a smaller number of cows and reduce risk. The other half went the other way and installed feedlots as a back-up plan. If you do a good job of either you will make money, but irrigated pasture is still the cheapest and best option for dairy cows when water is normally priced and you do a good job of grazing management.*

One of the local business owners, who also had a property, noted:

*This time last year we cut 1500 rolls of hay and this week we cut 96. I'm normally flat out now, doing hay, and it lasted one week. Normally it goes over six weeks. We bought our own seeder this year and put 250 acres of crop in—nothing. We will get some use out of it, but a month's feed and it's gone.*

A stock agent was very concerned about local farm businesses. He said farmers began watering in August and ran out of water in November:

*How they are going to survive? Hay is very dear. They can't buy it locally; they have to buy it out of the district and there is freight on it. A lot of them had to sell half their cows because they can't feed them. Normally, any other year, they would grow feed but they haven't had any water. All they have been doing is using water to keep pasture going to feed their cows. Grain has gone through the roof as well. Grain will go up \$20 to \$50 a tonne in the next few weeks. If you haven't got paddock feed all you can do is feed hay in the bales at night. Then milk levels drop down. It's costing them money to keep cows going. So they dry them off. A lot are trying to keep their cows going so they can get them back into calf. So they have to keep them cycling. If they can't get the cows in calf they are gone for next year. A lot of them are still way behind [with debt] from the drought three years ago ... because they had to buy hay in then. Then for the next 18 months they had to restock.*

Another participant found it difficult to separate the effects of trade and drought:

*Farmers sell their water and their farms become unproductive and you wonder whether it is a combination of the water trade and the drought or just solely the drought. I'd say it's probably a combination. The average dairy farm's got 200 acres with 200 megalitres of water. Things get tight so the easy way out is for the farmer to sell his water off. It's been making around \$1500, so straight away he has \$300 000 to clear his debts and he can try to get a job somewhere. The down side of this is that the farm is closed up: without water it's not going to produce anything apart from a bit of dry land cropping. So, if the water is traded off and sold downstream never to return, we're getting more unproductive land. I could take you for a drive around this area where there used to be just dairy farm after dairy farm. There might be one every square mile now, whereas there used to be 10 per square mile.*

## Perceptions of water trading

### *The benefits*

One of the local agronomists made observations about the benefits of temporary trade:

*The benefits of temporary trade are enormous for this district. There is a strong dairy industry, and a lot of businesses have set themselves up to run at somewhere between 130 and 180, sometimes 200, per cent of water right. So, over nine to 10 years on the Goulburn system without sales water, the dairy farmers are really embracing temporary trade, and it has been a means for them to continue to grow the cheapest source of feed, which is pasture. With temporary trade, the water still remains in the district, and that tends to keep farmers happier.*

Another project participant agreed:

*Temporary trade is fine—yes, it's good. It's making full use of the water that's available. For years the older farmers may have had, say, 500 megalitres. They would never use it; It would just sit there. So there would be no income earned from that water. Temporary trade puts all the water out there and allows it to be used. And for every megalitre that's being used you hope that it would produce some sort of an income somewhere, and that flows on through the town. For the old farmer to let it sit there and never be used, it's no good to anyone.*

One of the bankers believed temporary water trade was a necessity:

*The tenfold increase in the price as a result of the shortage is interesting. But it is really supply and demand dynamics kicking in. While we might sneer at the small operators out there, the system is reliant on them providing the trades. The market is so complex with rules with what can be traded one year to another. This is the system that has evolved and in most years it does work. I'm not in favour of any form of regulation or subsidy or whatever.*

The farm adviser offered a regional perspective:

*Areas around Boort that have been opened up—the benefits are huge for that little community, because there is so much more work and employment. If you went to Pyramid or somewhere like that where they have lost a lot of water, it is not so sure because of the social issues there. The people are so passionate about it because it makes them so frustrated to see water leave their district. But, holistically, the benefits outweigh the costs. But the costs are hard to articulate because a lot of the costs are people costs; the way they feel and what's happening to their schools, the number of kids, etc. So it is easy to say the benefits are this because we are now producing all this extra stuff because the water is moving from lower to higher value uses, but it's harder to say what effect it has on schools where numbers are halved or on towns that can't field a football team because there are less people.*

### The costs

One regional adviser believed the cost of water was the main disadvantage of temporary trade:

*If they have to do a lot of temporary transactions, farmers don't necessarily like the \$65 fee. I think that is a pretty minor thing in the scheme of things; probably more nuisance value than anything. Benefits outweigh costs especially in years of low water allocation: it just frees up water to people who can make money out of it. Although it's pretty frightening this year that people are still buying water at \$650 per meg. I suspect it's mostly orchardists who are trying to get a harvest or keep trees going. There are not many dairy farmers who would enter the market to spend \$650 to grow grass.*

One of the bankers interviewed observed:

*There are number of people who have taken good advantage of permanent trade. It has given some more security, and there are others that realise the capital that was tied up in it and then trade water temporarily. They*

*have the potential to come unstuck when the new water reforms are introduced. But others have used permanent trade to better their business but they don't necessarily like the idea. If you make a gross generalisation people say, 'Permanent trade into my district is good. If water leaves the district, it is not so good'.*

A farmer insisted that there needed to be a moratorium on the sale of permanent water out of the district.

Another resident also had a strong opinion:

*Droughts are preventable, manageable, if farmers have the resources for hard times. Governments have not increased storage and have bowed to political demands for too long. Temporary trade should be allowed in moderation. Farmers should trade only a proportion of temporary water. Everyone needs a buffer in water. Permanent water trade should just not exist!*

One farmer described his position and his concerns about the loss of water from the district:

*I believe the water can be traded within a system but not outside the system. Our channel is 50 kilometres long as we follow the creek system. We've got a dairy farmer who wants water every couple of weeks and then we've got cropping blokes that might want it in the spring and autumn. The fellow at the top end might want 10 megs of water so we might pump 11 megs so he can pump 10 megs out because he loses 1 meg through seepage and evaporation. We have to pump 50 megs into the system for the bloke at the bottom end so he can get 20 megs. We're selling water to Mildura and they're buying 100 megs from this system and they're getting 100 megs at the bottom end, so the seepage and evaporation over that distance has got to be two or three times. The annoying part for me is that the Eildon and the whole system were set up to irrigate the Goulburn Valley. The farmers paid for all that infrastructure over the last 50 years and now they're sending all the water downstream. I think it's there to be used for the Goulburn Valley.*



For others, weeds on abandoned dryland properties caused concern: 'Dairy farms that are now dryland, all it has done is encourage noxious weeds. When you drive around the shire you see a lot of scotch thistle. A lot of lifestyle farmers don't care about weeds and maintenance'.

Concern was also expressed about proposed exit fees:

*With unbundling coming in 2007 and exit fees applying for delivery, people who have been viewing their water as their superannuation feel that they have been really compromised. In July 2007 even if they sell water off permanently there is an ongoing delivery charge that they have to pay year in and out or pay an exit fee. The suggestion is that it will be worth \$300 a megalitre. If I had water for superannuation and was going to sell it off and use that capital to retire, that will be compromised by these exit fees. Those remaining in the industry—remain in the area and remain irrigating—think exit fees are great because it prevents price rises for maintaining infrastructure with the decline in the number of users, and they wish that fees had been brought in when water was first traded. It depends on your outlook and what your plans are.*

One participant suggested that there should be regulations to ensure that at least half of the permanent water entitlement remains with the land: 'If a farm holds 200 megalitres of water, 50 per cent should be tradeable, 50 per cent should stay with the farm. That way the farm is always reasonably productive. Half and half. It gives them room to move'.

Although most people rejected permanent trade, participants were aware that people reluctantly agree with people using this option:

*I've heard people say they don't like people selling but understand why they are doing it because people are seeing the value of water. If you've got it, it's your asset that you can do what you like with, but they hate seeing it leave their district. Many think we should try to retain a certain amount of water in their district, but the 2 per cent rule has been a bugbear for those wanting to sell.*

A farm adviser observed:

*Permanent trade seems to create more angst among farmers. The farming community doesn't like to see water leave their district. It's not uncommon to hear about those so and sos down the river taking all our water. It raises a number of concerns in the community. People see farms that were once productive dried off and not being used to their full potential, and there are problems with weeds and rabbits.*

One of the bankers observed that uncertainty in the market was affecting farm management:

*Farmers are good at looking ahead and structuring their business according to what sort of resources they have available. They like nothing more than putting plans in and having them come off and nothing irks them more than having the goal posts shifted. The irrigators on the Murray system in NSW have had to change their enterprise mix. They may have purchased water only to have that removed by the government overnight. It's hard enough for people running their businesses battling these constant changes. People won't invest in this region if they don't see stability, and that stability comes through good governance.*

An extension officer in the region said that allaying farmers' anxiety about uncertainty was one of his main objectives. The officers conduct small group workshops for farmers to explain the new rules and regulations. Three years ago they held focus groups with farmers across the state to discuss their concerns. The responses centred around four themes:

- What are the new rules and how are they going to affect me?
- What's that going to mean for allocations and trading?
- How should I best use my available resources?
- How will I know if it's going to be profitable?

Subsequent programs have been developed to address those questions and explain water reform:

*We have had to change tack a bit because farmers are just in survival mode. They are not interested in anything else except how to get through this drought with their business and their farm and family intact. In the July–September quarter we spoke to 18 farmers groups about the White Paper on water. Since then we spoke to one. Uncertainty is the big-ticket item—whether it’s drought or water reform. That’s what makes farmers nervous and less likely to invest.*

He added:

*Sometimes farmers have difficulty attributing cause and effect: is this the effect of drought or the effect of water reform? One said to me the low allocations are because we are going through water reform and Goulburn–Murray Water’s mismanagement of our water and the environment. But we can’t allocate water that’s not there. We have had 10 really tough years and water reform. It’s unfortunate but it’s all been rolled into one in people’s minds. The best way to explain water reform and engage farmers is one to one or small groups such as channel meetings, where we meet irrigators on a particular section of channel and explain water reform and look at their figures. When you have 15 000 customers, it’s resource intensive to do that. If we only see a third, what happens to the other 70 per cent? More resources would allow us to get to the breakfast table; but by the time you got round to everyone unbundling would be here and gone.*

## The impacts of water trading on the non-farming community

Participants discussed the impact of water trading on associated agricultural industries as well as on the local retail sector.

## The associated industry perspective

Participants noted that some businesses had been established in Kyabram as a direct result of the water trade, among them four water brokers and an irrigation company. On the other hand, the loss of water and the downturn in agricultural industries was seen as responsible for a local engineering company downsizing and the closure of three big canning factories in the district. In 2005 the Tongala milk factory stopped producing milk powder; it now manufactures only liquid milk products. One participant noted:

*The more farmers that sell their water and move away, the less productivity you have in the area and the jobs are going to become more scarce. It’s a catch-22 because all of sudden the farmers are throwing themselves into the job market and milk factories aren’t getting the milk. The canneries aren’t going to be getting the fruit this year so, whereas there might have been 1000 jobs in the past, there’ll only be 500 this year.*

Drought was blamed for the downturn in businesses.

A manager said:

*After Christmas it is going to be a big challenge. We do a fair bit of cattle—farmers have still got a bit of water now, but they are going to run out of water and are going to be forced to sell after Christmas. I reckon in January and February we may as well go on a holiday for 10 months or more. If we can get rain again and fill the catchments again everything will kick off again, even though there’s been a heap of water sold out of the area. It’s going to have its effect, there’s no worries about that. But nowhere near the effect if we don’t get rain.*

## The central business area

Interviews with local business owners revealed that some were downsizing:

*Because the money world is not spinning as quickly, it doesn’t come in. I’ve just put off a full-time staff member.*

*He was basically here so I could help on the farm. If I wanted to start late or go early there was someone here on a full-time basis. I sat him down on 1 August and said, 'If it doesn't rain by the end of September I don't think I'm going to have a position for you here'. I was prepared to make moves early on because there was a time before when I had a young fellow here who had a family and he didn't want to leave. I said to myself, 'If this happens again this is what I'm going to do'. This young kid didn't have a family and it worked out well.*

When asked how water trading had affected his business, one manager replied:

*We're actually about the same as last year. But I can't yet give you a true indication because there was another similar business down the other end of town that closed in August. I could be 10 to 15 per cent down, but at this stage I'm happy with the way things are going. I'll still have a Christmas but I think that will be it. Most irrigators in the area have got one or two waterings left and that will get us through Christmas. What we did notice was that everything that is selling was between \$20 and \$50. So I think people will still buy Christmas presents but the dollar value will be low. They are not willing to spend. I can't blame them; I'm doing the same.*

## *The community*

Other aspects of the community were stable, but there was concern that the lack of water would affect local sporting facilities:

*The sporting clubs are still good. It worries me if it gets that bad that we can't water our ovals and tennis courts and things like that. The kids won't play sport. If the footy ground's dry then they're not going to play footy. The footy club is battling. There's no money in the area. If it's a dry old footy club, for the lawn tennis courts and soccer grounds, the kids are going to walk the streets and get themselves in to trouble.*

Asked about the loss of community with the decline in the number of small dairy farmers in the region, a banker replied:

*It's reality; it's an inevitable consequence. By the same token, we need a region of strong, viable businesses that are growing and expanding because it does create employment and spin-off businesses. It will be a bad thing if it's all carved up into lifestyle hobby blocks with people out of Melbourne buying up for a sea change. I don't see that as the future. There is a reason agriculture has been a core part of this region for years. But the dynamics are changing rapidly as a result of water. But this can change rapidly if it rains and we get the water storages back up again, and people will have very short memories of how grim it looked.*

Project participants said drought and unemployment were the main factors affecting Kyabram and that the water trade has had a minor impact compared with these two factors.

One farmer noted that the decline in the number of farmers in the district was having an effect on small outlying communities: 'Water has left the district and there are now more dry farms. A lot of people left the district and school enrolments have declined. Smaller dairies have gone. Dryland farms cut hay and agist stock and raise calves. It's mostly older people. There are not many younger people under 40'.

St Vincent de Paul centres have been active throughout Campaspe Shire, providing support and conducting information days to tell farmers about the assistance that is available. But most of this support is in relation to drought relief. They noted that many farmers are unaware of all aspects of the available support. The manager noted, 'We are seeing different families than we encountered in 2002. There is more stress. They had more resources, more energy and more money in 2002; now it's all spent'.

Several of the residents of Kyabram were concerned about the stress the farmers were experiencing. One story, told in several of the case study communities, concerned a dairy

farmer who shot all his stock and then himself. Although regional health service providers expressed concern about mental health, the mental health service in Kyabram reported no increase in their client base in recent times. To raise awareness of their services and assess need, they conducted a doorknock in Kyabram and Rochester. They had no programs specific to farm families because they saw no need.

## Discussion

Kyabram is a picturesque community with a 95 per cent water allocation. Drought is the main factor affecting the community. Nevertheless, the water trade has allowed dairy farmers to trade out of the area, and project participants were well aware of the negative effect such a trend can have on a community. Water trading has led to the establishment of water broking firms and an irrigation supply company but also to the downsizing of an engineering company and the closure of three canning factories in the district. Participants were opposed to permanent trade but acquiescent about temporary trade. The growing number of hobby farms in the district is a concern for community structure, for the environment and for the loss of agricultural productivity.

## Community views in Tatura

Tatura, a community of about 3000 people located 167 kilometres north of Melbourne and 17 kilometres west of Shepparton, is part of the Greater Shepparton municipality. The district is famous for the development of the Dethridge Wheel, which is used to measure the amount of irrigation water released from a channel to a farmer's property. Dethridge meters were installed on irrigation properties after World War 1 (DNRE 2006).

## Economic profile

The Tatura district produces cereal crops, fruit, vegetables, dairy products, fat lambs and beef. In Tatura there is a tomato processing factory, a milk products plant and an abattoir.

Tatura Milk is an important manufacturing enterprise; it is owned and supplied by about 350 dairy farmers and produces a range of products—cream cheese, milk powders, infant milk formula, and so on. Snow Brand, another company in the area, produces cheese and infant milk formula that is exported to the Asia-Pacific region and Japan. The Unilever plant employs 150 people in manufacturing foods such as soups and sauces.

Tatura is also home to several government agencies, among them the Institute of Sustainable Irrigated Agriculture (Victoria's centre for research into irrigation management-related issues) and the Tatura Research and Extension Centre of the Victorian Department of Primary Industry. Goulburn-Murray Water's head office is also there.

International Dairy Week is held in January each year at Tatura Park, which is a state-of-the-art exhibition centre and showground. This is the largest annual dairy cattle sale and show in the southern hemisphere, attracting more than 6000 visitors from Australia and overseas.

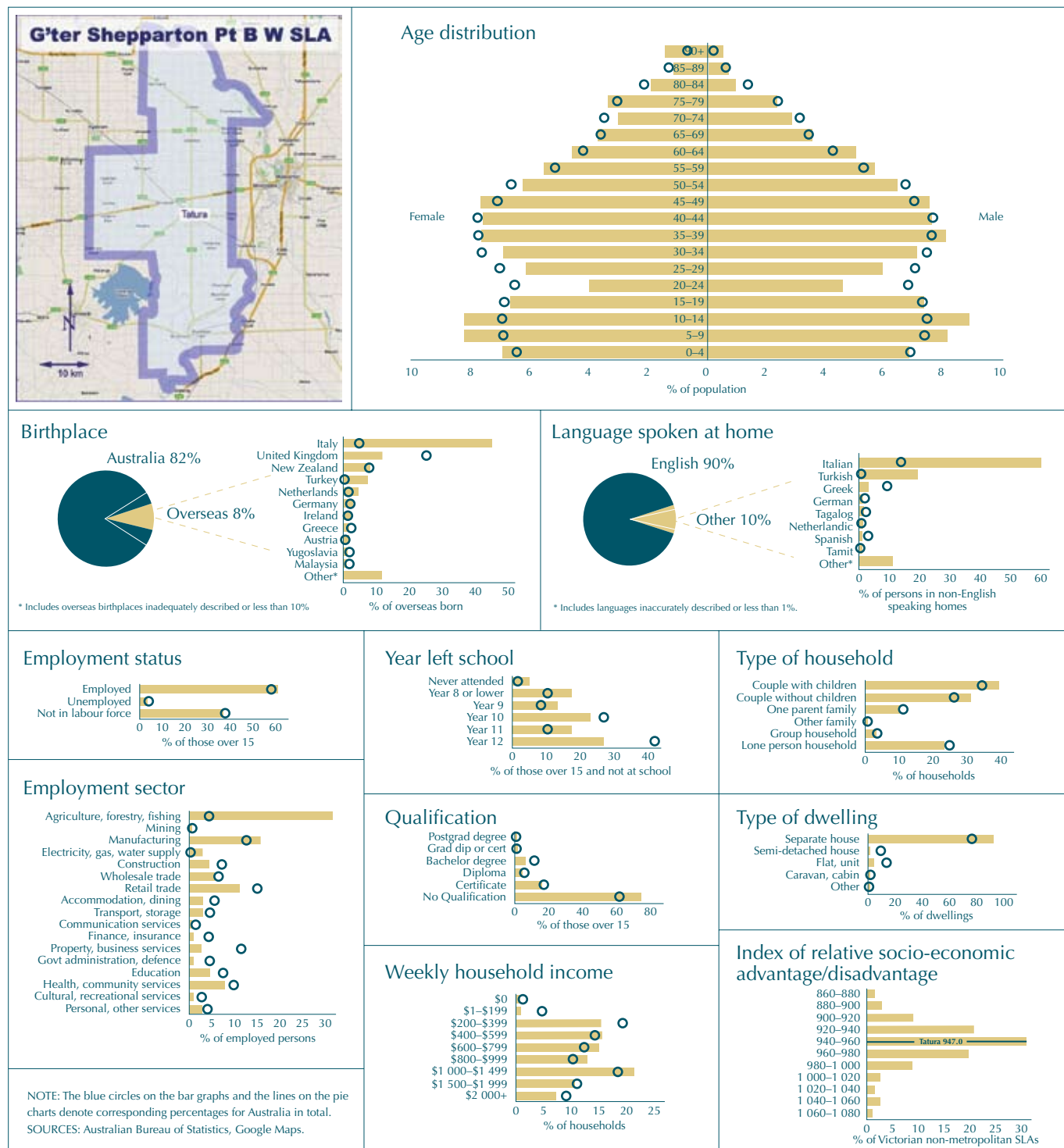
## Community services

Tatura has a primary school, four churches, a swimming pool, a recreation reserve and caravan park, an aged care facility, several social and sports clubs, a golf course and a shopping centre. There is no hospital or high school. Children attending high school must travel to Shepparton or Maroopna. This is a concern for community leaders, who believe such facilities are important to the future growth of the town. One service provider noted that the lack of public transport was another problem, especially given the high proportion of elderly people in the population.

## Community profile

Figure C.6 summarises the community profile of the Greater Shepparton Part B West Statistical Local Area.

Figure C.6 Greater Shepparton Part B West Statistical Local Area: community profile





## Community strengths

Tatura differs from most small rural communities in that it offers plentiful employment opportunities, mainly with local agricultural industries such as Tatura Milk. One of the focus group participants explained:

*There were some figures that came out recently, quoted by the shire, that Tatura has a population of 3000 and there were 3000 jobs in the vicinity with natural resources, the water commission, the abattoirs, the structural engineering etc. I know a lot of people come into the town to work but, with a population of 3000 and 3000 jobs, it's a pretty unusual town.*

Recent new housing developments have been a response to the increasing number of retirees moving into Tatura. Many of these people come from farms in the surrounding district.

## Community cohesion

Participants described the community as small and friendly. The farming district has traditionally been quite wealthy, and this has sustained the local community. One participant said, 'Because we have such a great agricultural industry around here, it's a fairly affluent town. The sporting facilities in the town have all been built through contributions from the working population in the town. The cricket and tennis clubs—they've all been community funded'. Another added:

*It's a wonderful town: every facility you'd need. When you compare Tatura [the satellite city] to Shepparton, the vitality of the tennis club, churches, blue-light disco, adds so much value to this town. In a big city you get lost and people just don't support these types of things. In small towns you can be seen; you get a bit of kudos for being involved.*

Community cohesion was demonstrated by one service provider's account of the support afforded local farmers during the 2002 drought. When the drought appeared to

break, the farming community held a barbecue for all the local services to thank them for their support.

## Community problems

The main obstacle facing the community is its proximity to the large regional centre of Shepparton. Many people who work in Tatura elect to live in Shepparton and commute daily. One participant explained:

*Because we are really close to Shepparton it influences what happens in our commercial area. We've struggled; we are right at the brink of becoming a satellite to Shepparton. The stream of people that travel to this town to work in this town is quite amazing. Only 15 per cent of the 300 people in the [a government department] actually live in the town. People like to live in big regional centres for the 24-hour shopping.*

## The impacts of water trading on the farming community

Tatura was a receiver of water in the early years of water trading, but more recently there has been trade out of the district to areas further down the Murray River system, such as Robinvale. Participants were concerned about the impact on their district of this loss of water and the subsequent loss of farm production and people from the district. As in the other communities, concern was expressed about stranded assets and the environmental consequences of this trend. The owner of an agricultural business said:

*My particular beef is the seemingly clear government policy of promoting irrigation development (often through managed investment schemes) downstream of established irrigation areas. These developments take agriculture to areas where there is minimal infrastructure, processing or community development. The tax breaks offered make them attractive against mainstream agriculture. In other words, we are exporting our water to areas which provide tax benefits—which doesn't*

necessarily equate to efficient agriculture—at the cost of previous government expenditure at the regional level. By sending water downstream, environmental benefits are often reduced ... The remaining irrigation communities are lumbered with failing infrastructure and the inability to fund stranded assets.

A financial adviser commented:

*The concern I have is the dramatic shifts in water moving into different regions. Areas that used to have significant irrigation infrastructure are almost being disbanded. Katandra West is a good example: there's been a lot of trade out of that area and, historically, this was an excellent area for dairy farmers.*

Even a water trader echoed these concerns: 'I've moved a lot of permanent water out of these districts over the years. I prefer to see water stay in a district because of the social impact that it will have, and is having, on communities'. Focus group participants also discussed the subject. One farmer said:

*There is a chap here who sold all his water. I don't think he's even got stock and domestic. That 320 acres goes out of production as far as Tatura Milk goes. I don't think he's going to be able to live there so he'll move out and that's a loss of kids from the school, spending in the town—that's all because of water trade. Ten years ago he would have sold the farm and the water would have stayed with the farm, and someone else would have bought the farm and had a go.*

Another agreed:

*When water trading started we all thought, 'What a sensational idea'. We had all this water over at Pyramid Hill, which should never had been irrigated, and of a lot of it came here, which enabled farmers to expand to make more money and spend more money in this area. Now it's bypassing here and going down to the [managed investment scheme] storages on their farms so they can spend their money and develop in another area. Robinvale*

*has kicked on—it's fantastic. There are new houses and blokes with machinery moving in there and they all have jobs and it's going well. Poor old Tat. There are a few second-generation farmers around here, but young fellows are going down to Melbourne, getting other jobs, and are not interested in farming any more. Farmers have the opportunity to sell their water, pick up some sort of superannuation, and either stay on the dry farm until they die or sell the farm cheap and move into town.*

When asked if the loss of people could simply be a reflection of the common trend in rural Australia towards farm amalgamation, participants claimed that this was not occurring in their district: 'The expansion and buying out the next-door neighbour has gone—finished. That was a big option up to two years ago. Even after the drought it was still happening, but now it's reversed. People are subdividing into smaller blocks'. One participant explained:

*I've been hay contracting for 25 years. In the past some farmers had a bit of laser work done but down the back they might have had 40–60 acres of pretty rough sort of country. Whacked some water on if they had some, but most of the time they didn't worry about it. But over time farmers have farm-planned the lot, lasered the lot, sown the lot to try to get their productivity as high as they could to remain viable. The fact is they can't expand any further. The commodity prices haven't helped them. Their children have left the land and they really have no option but to retire on their farm or sell their farm cheaply.*

Asked whether water trading was responsible for these changes, a participant replied:

*You have a whole lot of things happening and water trading is only one. How big an influence it has is another issue. At the moment some see it as a negative. They might be right. We might be grateful for this trade to reboot these dry areas in the future because the infrastructure will be still here. Flexibility, that's what we have to retain if it proves that dairying is going to be OK for the next five years.*

A financial adviser was asked his opinion about the number of farmers leaving farming in the district:

*Regardless of what is going on with drought, the fact is smaller farmers need to be larger to be viable. You get economies of scale, and lesser quality farmers in marginal areas will continue to be marginalised and will continue to exit the industry. Drought probably hastens their decision, and in some cases the banks, to move away. It's a natural progression.*

*There are some very well established operators, and they don't find themselves with their hands forced in any way. They have the appropriate level of equity. I'm disappointed in the way Exceptional Circumstances is set up in that it is limited to \$100 000 for an interest subsidy. That's only \$1.0 to \$1.5 million of debt. Many farmers have more debt than that. The assumption is that if they have that much debt they can look after themselves. I disagree with that to some extent. If an enterprise has got themselves into a pretty robust position that they can borrow that much debt, they are probably top operators. They are the ones we should continue to support—perhaps even more so than those that are more marginal. The marginalised ones are going to exit the industry anyway. I don't think we should be decreasing support for the top end.*

When the farmers in the group were asked if they were participating in the market, they responded, 'Very little. It's too expensive'. One farmer played the market on one occasion, which proved to be a bad decision:

*Two years ago I paid \$1100 for permanent water because I thought it would go to \$2000. I bailed out this year because of exit fees and channel capacity. I only did it once as a punt. All the rest of our water purchases were for continuance. We have bought permanent water over a long period of time because we only have a small water right. We didn't have to rely on sales. They were there for tough times. If there was a dry break you weighed into*

*your sales. It was never a problem. Prior to water trading most dairy farms were reliant on sales for 180 per cent allocation. That's changed big time because water hasn't been available to us as sales because it's gone down the river or whatever. That's put pressure all the way along the line because sales have not been available. I don't think we will ever see those sales again.*

Another added that drought had hastened these changes. Before 1990 farm plans were based on 80 per cent sales. He added that as laser levelling became more expensive farms required more water to grow more feed to become more viable. A financial adviser noted that there had been other major adjustments in farming practices as a result of the water trade:

*Farmers have adjusted their production systems considerably. Dairy farmers used to rely heavily on a spring-based production system—such as calving in spring—but there has been a significant turnaround in that there is a lot of autumn calving with more winter-based production systems drying off in summer, when you get poor utilisation of water. I think that better utilisation of water has a long way to go. The way the government subsidy is set up is not quite the best. You might get a subsidy to do a whole-farm plan, which is essentially based on flood irrigation, but if you set up a travelling irrigator or subsurface drip irrigation system you get no support. Both of those are essentially more efficient than flood irrigation.*

When focus group participants were asked how they saw the future of the district, they expressed concern about the unbundling of water rights. One said:

*I was talking to some fairly influential people who had done research on where water will be in 2010. With unbundling, this person said he can foresee that people like superannuation funds and insurance companies will buy large tracts of water, then sit on it, and then sell it to towns and will make very good returns on it.*

Another agreed: 'It's happening in Nanneella and around that area. Managed investment schemes are buying farms now. They are using farmers, supplying them with money to buy farms, and parking water on them. And they will lease it to Bendigo at a huge cost'.

Although the participants agreed that the 30 000 megalitres required for the city of Bendigo was insignificant considering the 1.6 million megalitres available in the Goulburn, they were concerned that, should the price of water reach \$5000, people might discontinue farming: 'I think some will and some won't. I think the infrastructure to supply water—it won't be sustainable. That's the worry I have'.

One participant said supply and demand would not see water at \$5000 and that drought tended to cloud the issue. Someone else concluded, 'We are on excellent soils; we are high up in the landscape as far as water goes. We have ground water control. This is an area that will be reconfigured positively. And we need to make sure it is reconfigured'.

## Perceptions of water trading

### *The benefits*

One participant argued that water trading could be beneficial for the district: 'People are buying water, taking opportunities and being flexible. We are saying it's bad but I'm not sure that putting a moratorium on or having no more trade is the best way to go'.

An agribusiness consultant noted that trade in permanent water could be seen as drought insurance:

*In some situations, when things are tough financially, farmers may offload some permanent water to alleviate debt. It devalues their farm and makes their farming system much riskier thereafter and prevents the capacity to turn around quickly. But it can get them out of a difficult situation brought on by a severe situation such as drought. Permanent water on the face of it is a pretty poor investment but it is an excellent insurance policy*

*for a dry year like this. If you had someone with a very high allocation of permanent water entitlement and they might have different water sources—they might have groundwater or a diversion licence—that is very secure. They might have a turkey's nest or a bore, then offloading might be a wise thing.*

### *The costs*

Participants talked about the negative impacts of permanent trading associated with stranded assets and the proposed exit fees. One was concerned about the environmental impacts of increased flows in water channels: 'Before water trade, if you were a blockie or a farmer that didn't use all your water or it was a wet year, you paid for your water but it stayed up in the hills. Now every meg that is allocated is used. The entire Pyramid area—there were thousands of megs of sleeper water sold and used'.

The uncertainty surrounding water policy was the main concern of focus group participants. One farmer said:

*You don't know what the government is going to put through next. There is all the legislation the government hasn't put in the fine print. We are sitting on water, which is the lifeblood of this area. It's everything. The way it's going. Everything's been set up to trade water out of here. Nothing's been done to keep it here. We have to grow something that makes money. The reason we haven't got youth in this district is because we haven't got money.*

Another added:

*What is making trade difficult is the uncertainty of it. Why haven't they nominated the exit fee? Why don't they set the fee right here and now? The lack of knowledge, the insecurity and unfairness. You sell 100 meg downstream, permanent or temporary, either way. You will get 23 per cent of that and they take it down the river and they get 95 per cent. Talk about insecurity. That typifies the unfairness. We don't understand it; we get knotted up about it.*

## The impacts of water trading on the non-farming community

Focus group participants were asked about the impact of water trading specifically on industries that support the agricultural industries as well as on the central business area.

### *The associated industry perspective*

Participants noted that, unlike some neighbouring communities, Tatura has not experienced any major loss of industry. Recent changes in local industry practices and reductions in employees were, however, a concern:

*By having those government jobs here it insulates the town to some degree, but I feel the drought and water trading are starting to take effect now because as the water leaves so does the income, which affects this town. Unilever is no longer expanding their factory, Tat Milk store has been curtailed. Tatura Milk will have to amalgamate with someone else to go ahead. And that's totally water related.*

When asked about agribusiness start-ups and closures in the region, a Shepparton-based financial adviser reported that he was unaware of any closures. He maintained local businesses were 'hanging on at the moment' but were experiencing tough times, particularly with suppliers failing. As for business start-ups, he noted the increasing number of water brokers in the district, adding, 'They will become more important, too, as the complexities of the market system increase rather than decrease. Water brokers will be in a good position to capitalise on that'.

One impact of water trading that has benefited the local economy was an influx of New Zealand dairy farmers coming to the district, investing in an area they consider to be very cheap for milk production.

## *The central business area*

When asked if the water trade had affected the local economy in any way, one person questioned whether the effects would be related to the water trade or to drought: 'If we had 100 per cent or 120 per cent water at the moment, which is nearly inconceivable, but we still had trade going on, it would be a different scenario. The drought has just brought these issues together'.

In recent times five businesses have closed in Tatura's main business area. Among them were a chemist, a hotel, a furniture shop, and a hairdresser. Project participants reported that the town's proximity to Shepparton had the greatest effect on the local economy. On participant contention that the chemist had been unable to compete with wholesale businesses in Shepparton whose prices were 15 per cent cheaper for most items. He continued:

*There is enormous pressure from a regional centre. We haven't got any tourism. The Goulburn Valley isn't tourist oriented. This is a service centre for the dairy industry and a construction town combined all together. Its never had to, or needed to, try to sell other things. Its never had to expand. In many ways it has the appearance of a town that doesn't worry about it. Towns that are on about tourism have different views about tidiness and streetscape.*

The fact that a large proportion of the town's workforce commute from Shepparton and Bendigo means that few spend locally. One focus group participant explained:

*It's the agricultural sector that really supports the town. The people who come into town to work and live elsewhere aren't going to spend very much money in the town. They are going to spend it in the bigger regional centres. What's happening is starting to take effect now that some of the places are closing down because people on the land can't sustain any spending here.*



## The community

Participants were concerned that the population was not growing. One said:

*We can't keep losing our youth, and the school is struggling in the area where we come from. It was a vibrant community. People are selling their farms and leaving. Where there were six farms, there are now 10 hobby farmers, but they don't seem to become part of the community: they like to live on their own. As a community, we seem to be going backwards.*

Community organisations have difficulty finding people for committees. One participant explained: 'It doesn't matter what committee you are on, it is not getting any easier. The hospital committee just welcomed a new member who is in her 80s. The footy club is struggling'. Another added:

*Two things that the town has lost are young farmers groups and Apex. They folded 20 and 10 years ago. That's where your leaders of the community were born. It all comes down to youth. This being an agricultural area it doesn't matter if it's a footy club or a dance club, or whatever, you can always tell how healthy an area is by the number of young people coming through. If you look at the agricultural industry, we don't have the young people. When I was young if you went into farming, you had it made because farms made heaps of money. If you went into a trade, it was a mediocre life because tradies didn't make much money. Now it's reversed. These kids go to Melbourne and if they get a degree they make money that I dream about. My kid went from uni—\$62 000 straight out. He's 22. How do you get a kid to come back on a farm with a \$2 million investment at least to make \$25 000. This is what we are up against.*

When asked where the community would be in five years' time, a participant responded:

*Tatura will survive but in a different form. There may not be the amount of things up the main street. The income of the town will be generated more by retirees. Tatura will still be a nice town to live in; it just won't advance.*

*There are 3000 people here now and there will still be 3000 people then. We will just be older.*

## Discussion

As for Kyabram, for Tatura the impact of the water trade is secondary to other impacts such as drought, the loss of young people from the district and, most importantly for Tatura, close proximity to Shepparton. Drought and the prospect of becoming a satellite town were central to participants' discussion. The water trade has been the vehicle for farmers to leave farming, and the flow-on effects of that are being felt. Proximity to Shepparton has led to a growing number of hobby farms as farmers move on. Tatura has not experienced any losses in associated industries, but recent changes in local industry practices and reductions in employee numbers were a concern.

## Community views in Kerang

Kerang, a town of about 4000 people, is on the Loddon River, 279 kilometres north-west of Melbourne on the Loddon Valley Highway. The regional centres of Echuca, Bendigo and Swan Hill are within an hour away by road. A commercial centre for the surrounding farming district, Kerang lies in Gannawarra Shire and houses the shire offices. The town is surrounded by an important wetland system of about 50 small lakes and swamps that provide habitat for thousands of waterbirds.

## Economic profile

The main agricultural activities around Kerang are dairying, livestock, cropping, viticulture and horticulture. Dairying is one of the primary agricultural industries in Gannawarra Shire, producing about 350 million litres of milk annually. Piggeries in the area are a significant employer, producing 30 per cent of Victoria's total pork output. There are irrigated pastures as well as dryland production of beef cattle, prime lambs and goats.

Dryland and irrigated grain—including cereals, oilseed, legumes, lucerne and rice—is also grown throughout the shire. A range of hay products are produced: lucerne hay, oaten hay, pasture-based hay, straw, vetch and chaff.

As for horticulture, Golden Rivers Country incorporates 15 growers and approximately 1000 acres under cultivation. Both navel (winter fruit) and Valencia (summer fruit) oranges are grown; the district is also one of the largest grapefruit growing areas in Australia. The Border Packers juice packing and juice works in Koondrook employs 30 people.

A wine grape growing area at Kangaroo Lake and Lake Charm, north-west of Kerang, includes Brown Brothers vineyards, where 250 hectares are currently planted and another 400 hectares are under development. A new 115-hectare cherry orchard at Kerang is one of the largest cherry orchards in Victoria. Chirnside Horticultural, south-west of Kerang, is one of Victoria's largest processing tomato growers, producing about 20 000 tonnes annually.

Other crops grown are walnuts, jojoba, apples, olives and vegetables. The harvesting of red gum began with the early settlers and has proved a sustainable industry. There are several red gum furniture manufacturers and craftspeople in the district.

There is also a considerable amount of manufacturing linked to the agricultural industries—for example, the manufacture of milk, fruit and grain products and of agricultural equipment—as well as a centre for testing hay and grain. Among other enterprises are irrigation equipment suppliers, surveyors, farm planners and water traders (Gannawarra Shire 2007).

## Community services

The town has a hospital and medical, dental and aged care facilities. The doctors service a large surrounding district, and the area is considered under-resourced. There is no public dentist. There is a preschool, a primary school and secondary colleges, plus a number of churches of various denominations.

## Community profile

Figure C.7 summarises the community profile of the Gannawarra Statistical Local Area.

## Community strengths

Project participants said the diversity of the agricultural industries was one of the district's strengths. As one service provider explained, the combination of dryland cropping, grazing and irrigation provides security:

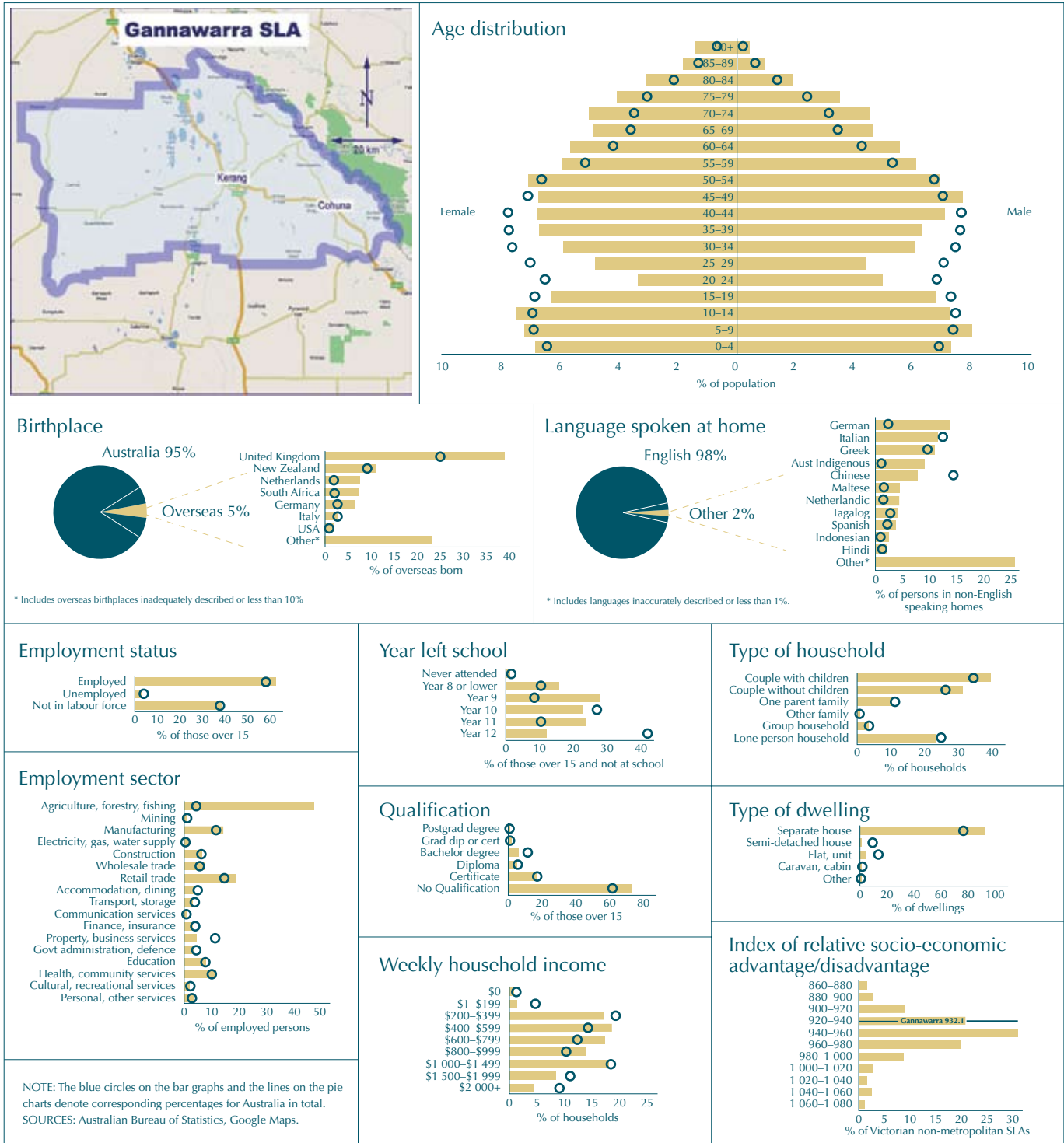
*If you go west of Kerang it is all dryland farming. You go north, there is a mixture of dairy, horticulture and dryland farming. And there are a lot of traditional irrigation graziers there as well. You go east of Kerang and it is all irrigation, lots of dairy farms, tomatoes, grapes and olives. And south of Kerang there is a mixture of dairy, irrigation and dryland. The town itself has been sustained by irrigation. There are a lot of support industries because of the irrigation—Goulburn–Murray Water, Departments of Primary Industry and Sustainability and Environment—and because of that there are schools and hospitals.*

One resident believed the location was everything: 'It's a great little community. It has a bit of everything. If you're into fishing and outdoors stuff it is great. Within half an hour we can be picnicking on the Murray or out on the lake fishing or whatever we want to do'. Another agreed: 'It has lots of churches, a lot of pubs, and 101 things to do with a ball. Sport is the main thing that brings people together'.

## Community cohesion

Kerang's community is characterised by a mix of nationalities and beliefs. Most project participants rated community cohesion as a three (where one represents an absence of cohesion and five represents a high degree of cohesion). Many argued, however, that, although there are separate groups within the whole, there is nevertheless a strong commitment to the town. One participant said:

Figure C.7 Gannawarra Statistical Local Area: community profile



*There is a mix of traditional family farms and people new to the industry. There is also a mix of types of farming. There are different communities within the whole. The Italian community is fairly involved in horticulture, particularly in tomatoes. They are long established and as Aussie as the rest of us. There is a strong Turkish community here as well. The community involvement and spirit is tremendous.*

One of the farmers added:

*Kerang's community is pretty good, but it is a diverse community. Up until the last four years we had relatively cheap housing, so we have a reasonably high population that are unemployed and probably aren't seeking employment, and I can't help but think that's on the rise. You give them every opportunity to come out and work and they don't turn up.*

Of interest is a large community of Exclusive Brethren who live in the town. The group owns and operates a manufacturing and exporting company, and many of those interviewed obviously saw this group as the 'other' in the community. One explained, 'They are very good business people, but they are very insular. They aren't part of the community. Apart from business interaction, they don't mix in at all'. Despite this, another resident gave an example of community unity:

*I've just come from a community meeting to do something about the state of the river. We had all the government people there, and it was a perfect example of people power. Things that were absolutely taboo suddenly could be done because there were 30 irate people. Yes, I would say it was a good community. I wouldn't say we were a really tight community, but it's pretty good.*

One of the farmers told a similar story:

*There have been a lot of issues in relation to the water and rates. Five years ago our land rates were going through the roof, and there was a group of farmers and they got their rates cut or reset at a more reasonable rate. So when things need addressing, as a community they do get*

*addressed. But I think you will find a lot of the same people are pushing those sorts of things most of the time, so it would be nice to have some new drive and input.*

A shire representative gave an example of community action to increase cohesion:

*We have Asian, South American and Sudanese workers here, and they have fitted in extremely well. The local Lions Club mentor them. They teach them English, take them to soccer games and organise sports for them. We have a couple of Sudanese men who were refugees in Melbourne for four years and now we have brought them out to the country. They have fitted in extremely well too. One works on a dairy farm; he's been in every magazine that goes. The people who have hired him are a young couple, and [they] are very pleased with him. I visited him and he told me when he was in Sudan they had a dozen cows and they used to hand-milk them and take the milk to a market 6 kilometres away. They used to have bags of grain to feed the cattle. He came here and there is a truck full of grain and a rotary dairy with about 400 cows; he just looked and said, 'How are we going to milk all those cows?'*

## Community problems

Drought, salinity and water restrictions were the primary concerns of the people interviewed. One of the farmers said, 'We are all anxious, all praying for rain. It is OK this year but next year it will hit. At least this year we have stock and domestic water. It is hard to stay optimistic with the industry down. There have been 10 years of drought. It is frustrating not being able to pay shire rates and fuel bills'.

Other concerns were the loss of population, particularly the district's young people. A shire representative maintained that population loss was the greatest concern:

*Our population has been declining; we are waiting on the latest census figures. There have been a lot of people moving in here, but we also have a proportion of people moving out. Farms are amalgamating. Young people in*

that 17–25 age group go away to university, training or employment, and getting them back is really difficult. The greatest challenge is to grow our population, provide employment and development to support that population growth, retain and increase agricultural production, and diversify and specialise. People say we shouldn't be so reliant on the dairy industry, and I say but the dairy industry is a specialised industry that requires a lot of add-ons.

He added, 'Another challenge that we have to overcome is the separation of land and water. That will take a huge amount out of rate revenue. The sustainability of the red gum forest is another major challenge in this area'.

Farmers in the district reported a shortage of reliable labour:

*In this shire we have some socio-economic issues. We are third from the bottom in the country. We have a workforce that is not particularly skilled. There are a lot of people that haven't been to high school or tech or TAFE or haven't had a job. It's a bit of a challenge when training people sometimes. There are people that could work but to skill them to the point of being able to milk cows in a million-dollar shed sometimes falls apart. Farming is not for the kid that did not do well at school. It's for the one who can run a business and one with people skills, and you need an economics degree as well just to make sure.*

## The impacts of water trading on the farming community

Most project participants referred to the drought as the greatest factor affecting Kerang at present, but the long-term trade of water out of the district was also a big concern. A service provider defined the difference in the impact of water trading and drought:

*The drought impact is really big because it affects all the industries. The dairy industry relies heavily on the dryland farming to provide a lot of fodder and even agistment. Since the 2002 drought, dry stock have been agisted off farms, so that every acre is put into milk. So, when*

*the drought hit, it hit everywhere. Water wasn't such an issue initially. For a lot of irrigation farmers it was like cooking a frog. They didn't get into boiling water in the same way as a dryland farmer did in 2002. When the drought really hit, they still had water. As there was still a capacity to farm, they got into hot water more gently. If you put a frog into boiling water it jumps straight out but if you put it into cold water and gradually heat it up, you cook it. The water did lull people into a false sense of security, thinking this is the one-in-100-year drought and it will be fine again in a few years. But it didn't get better, and it wasn't fine, and the water just got hotter and hotter.*

One of the farmers noted that drought heightens concerns about the water trade:

*If we weren't in the worst drought, would we be having this discussion? We'd have sales water and it would be OK. There would certainly still be some concerns about permanent trade. But we've had trade for about 10 years now, and all of a sudden people in Rochester and surrounds have stood up and said, 'Hold on! We can't have all this trade of water going out'. Up to now they've had either positive trade or neutral water balance, and Pyramid has been the big loser. Now the pendulum has swung.*

A shire representative was supportive of the trade:

*I don't believe we should try and stop water trade. That cat is well and truly out of the bag, and we need to make it work. Obviously, they are trying to encourage the most efficient use of water, but there are people issues in that and a very liberal interpretation of what the best uses of water are. A simplistic view is you put it all into high-value horticulture but then, when the bottom falls out of the market, what happens then? Life isn't that simple; markets always move. There is a range of perceptions about whether flood irrigation is a good or bad thing, but there has been some research done that says in the right place in the right kind of soil it is actually very efficient, and at this stage there are no better alternative technologies.*



An extension officer summed up the general perceptions of water trading in the local farming community:

*In one of the local areas that had most of the water sold off permanently, the remaining farmers talked about the land being unproductive and cheaper and undesirables moving in. They felt that their sense of community had been eroded by water moving out and less agricultural and less community minded people moving in. When they see land sold and families leaving the district they link that strongly to permanent trade. Sometimes you hear farmers reject economic rationalism and the need to move water to higher value uses. They don't see it being good for their industry or their community. Farmers don't like the managed investment schemes and the tax benefits they enjoy. They feel they can't compete in that kind of market place. These schemes drive the price of water up; water leaves the district and bad things follow.*

One of the farmers demonstrated this perception:

*I reckon water trade is a positive thing, and it's the way to go providing it is not at the detriment of communities and it means irrigation areas are shut down. That is just not on. A lot of people will argue you shouldn't be watering pasture anyway, but the most profitable use of water two years ago was to water grass for prime lambs—better than grapes, capsicums or olives or anything else. OK, it was one year, when lambs were \$140. The grapes only lasted one or two years, too, so olives will be the next things then nuts up at Robinvale. This huge place going up at Boundary Bend, on the sand, if it was in the US no way they would let them do it. Because they are putting on 14–15 megs a hectare to grow almonds, and that is way above any other use. And everybody is saying exactly the same thing. In the US it would not happen because it is not efficient: all they are doing is watering sand. So don't give me this argument that it is best practice. If you want to create a system that is sustainable long term and ride the peaks and troughs, that system has to be designed around your generic prime lambs, dairy, cropping scenarios. I don't think you can build a system around fads and fashions.*

An agribusiness consultant agreed:

*One of the things that I really have a beef about is this talk about sending water to a more efficient use. Who's buying the water? Almonds, olives and grapes? What are we going to do next? Are we going back to the vine-pull subsidies? They're talking about it in South Australia. So, all we've done is shifted water from basically productive family farming to tax-driven enterprises creating gluts for worthless products. I don't see any sensible planning in the system that allows that to happen. Is that good management? It certainly goes under the guise of good management, but it's ridiculous.*

One of the shire representatives was, however, supportive of managed investment schemes:

*Managed investment schemes are great if they are in our shire; if they are in anyone else's shire they are terrible. At the end of the day, managed investment schemes are a reality; they are out there and we have to compete, it is as simple as that. And they are an option for development, so we are looking at new portions of irrigation land that we can open up to suit these managed investment companies to try to attract them into particular areas.*

One participant reflected community concerns about the future of irrigation in the area: 'The biggest challenge the district faces is the demise of the irrigation industry. Kerang is in a pretty difficult position because it has generally poor soils and it is at the end of the irrigation system'. Another added:

*By the time the water gets to Kerang it is at the end of that system. Between here and Swan Hill the soils get really bad, and there has been all sorts of talk about retiring land from the irrigation system. One of the other problems is that the water that's being sold off is leaving stranded assets, so you get farms with no water on them anymore. Once the unbundling of water comes in, that removes the last obstacle for the water authority for shutting the whole thing down because at the moment they still have the obligation to supply stock and domestic water and keep the system going. Once unbundling comes, that's it.*

A further concern was the lack of management of environmental flows:

*I'm of the age where I'm a bit more open minded and understand a little bit more about keeping water for the environment. But we've got a lake behind our properties. In a dry year they put water in it, but it might only last eight weeks. The birds go there and nest, but the water evaporates so quickly. It's like giving someone a house and then burning it down on them two months later with all their stuff in it. I don't think there is much practicality in their decisions a lot of the time. Probably does the environment more harm than good. I'm not going to jump on the bandwagon and say there shouldn't be environmental flows; it just needs to be managed better.*

## Perceptions of water trading

### The benefits

As in the other districts studied, participants were supportive of temporary water trading:

*The temporary trade—to a certain extent it is fine. At least the water is not gone forever, so all the infrastructure and everything will stay whilst there's temporary trade. It's allowing people to get out of jail at \$300 a megalitre or whatever it is at the moment. That's just money for jam. And whilst we still actually have some water to sell, as opposed to the poor people in the Goulburn Valley, people who have none.*

There were very few positive statements about permanent trade, although there was reluctant acceptance of the reasons farmers sell their entitlements. One participant said, 'The benefits are—what do they call it? "Leave the industry with dignity"—rubbish. It's not leaving the industry with dignity: it's selling out. But it has allowed people to get out of trouble'. Another added:

*There are a lot of people who do it as a justified business decision. There is no doubt it is warranted on an individual basis. Sometimes it is a way of managing*

*individual debt; sometimes it's a way of retiring; sometimes it's a way of just managing a farm better. I know there is one guy who deliberately sold his water right because he was in a better financial position if he sold it and brought water in on a temporary basis. Farmers can get just as much for their water right as they could for their property 10 years ago.*

### The costs

Participants noted that temporary water trading can reduce productivity:


*While farmers are selling off their water, they're not doing anything to their farm. In fact, some farmers take the opportunity to laser grade and do some stuff while it has gone. The drought skews everything. Ignore the drought and, for people who need to trade water temporarily, I think it's been a boon.*

The price of water was a further negative: 'All it has done is created debt for most people because they've had to buy the water. But that's only because of the drought. Water trading has given water a real value, but it's a lot higher than it used to be. I would like to have 1000 megalitres of water to sell temporarily'. Another observed, 'Water's dearer than fuel. If you go and buy a bottle of water and get your fuel, it's \$1.80 for 600 millilitres of water and \$1.20 for your fuel, and people complain about that. That's reality'.

A participant noted the social cost of permanent trading: 'The disadvantages are huge because we lose a major asset. People, industry, activity—it just all goes. The land without water rapidly becomes fairly ugly in this part of the world'.

Another focused on the social cost of managed investment schemes:

*Everyone says the managed investment schemes are great. They bring jobs, they bring new investment, but they also bring a lot of baggage with them. Look at what happens in an area where the water goes. Look at Robinvale because there have been a lot of negatives said about*



*Robinvale with all of those cultures coming together. The media called it a 'social train wreck'. That's one of the difficult areas to manage when you have a lot of these big horticultural projects. You need that labour force, and the only way is to use a migrant labour force, but that comes with social issues.*

One of the water traders interviewed was also against permanent trading because of the social cost:

*I'm in a difficult position. I'm against water trade and I do it. It's terrible isn't it. Morally bankrupt. It's opportunistic. We're in the irrigation industry and it's practical do it. It gives people a great opportunity to get out of trouble. I'm more concerned about the long-term effects and I'm really cheesed off about the way it's going. The fact is that it is getting wasted downstream and causing us huge amounts of cost and angst. We've got to put in infrastructure, build a new Murray to get more water down there. For what? They'll all be bankrupt in three years' time. What are we going to do then?*

The loss of farms from the district raised the problem of stranded assets and diminished aesthetic appeal:

*Because of permanent trade, people walked off and left the district. The population decreased, income went down with water taken off the land. It flattens everyone. You drive past a beautiful, thriving farm and see it just let go. It upsets people.*

*Those at the end of the line are responsible for the maintenance of the channel to get water. We will see a time when water won't get to them. With open channels, they lose water through evaporation and the costs of delivering water make it unviable. But when the pipeline was put in Normanville, the farmers have filled in dams and there are no birds or wildlife. Channels do waste water but they provide an ecosystem. And water attracts water.*

Uncertainty about the future of irrigation in the district and about water allocations and drought was expressed:

*With so much uncertainty, you can't move forward. We are hobbled as a community and area because this is hanging over our head. OK, the government can come out and say we are not going to shut anyone down, but everyone knows that, in reality, if the pendulum swings far enough, one day they will change their minds.*

## The impacts of water trading on the non-farming community

Participants were asked about the impact of water trading on associated agricultural industries as well as the local central business area.

### *The associated industry perspective*

One service provider explained how a downturn in agriculture would affect the town of Kerang:

*Kerang is here because there is an agricultural community around it. Although there are other industrial things coming, which are great, most of the businesses here are associated with the farming industry. When you lose permanent water and then have a very bad drought for the big dryland farms out to the west of us, it puts pressure on the town.*

But the shire representative was positive about the impacts of water trading:

*The impact of the drought is one of the biggest challenges a community can ever face. Ten times bigger than water trading will ever be. When we look at Kerang most people say, 'Wow, you've lost all this water. Gee, things must be going bad', but it's not the loss of water that people should be focusing on: it's the amount of water that's used on farms because that's where your production is. Because the capital cost of water has risen so much, people that once bought their water for \$150 a megalitre can now get \$1200 a megalitre for it. That's huge capital growth. What they are doing is selling their permanent water right and buying in temporary water. So, if you look at*

*the water-use figures for the Torrumbarry Irrigation Area, while the permanent water held in the area has reduced, the water that's actually used in the area hasn't reduced that much, so the production capacity is still here. This town, where a lot of water is traded out, we should be going backwards, but we are not, we are going forwards. You go and look around town, everything looks quite vibrant. It's a beautiful-looking town.*

He spoke of a number of new businesses that had recently opened in the town:

*We have had a new Toyota dealer and a new Korean car dealer open. The supermarket changed hands two years ago, and they have made a significant investment in upgrading the premises. We have new businesses, a ten-pin bowling centre, a real estate agent, a hairdresser, and a feed test centre which tests hay and grain. We've had significant development in the industrial estate: we have probably sold about 14 industrial blocks, and we are doing another 12-lot subdivision there to cater for new development. We have had businesses move in from Melbourne and new Goulburn–Murray Water offices just up the road. You can't get a parking place in town during the day, but that doesn't mean that we are absolutely safe and secure: we still have to keep working hard to make sure we grow our business sector and diversify our farming sector.*

He said the shire had been active in developing irrigation-based industries in the area:

*We also have agricultural development—a new 250-acre cherry orchard, and the Brown Brothers development [one of the larger vineyard operators in Victoria] currently has about 800 acres planted, so that's significant. The cherry farm has been there about four years. Council found a fruit company that wanted to expand their operation and needed land and water and investment dollars, so we found a farmer prepared to put land and water into the project and a developer wanting to put in \$400 000, and they formed a company and got that development going.*

One of the local farmers acknowledged the expanding industrial centre but reported that most of his business was conducted in the larger regional centres:

*All our machinery and spare parts come from Swan Hill or Echuca, because we don't have those sorts of services in town. There is very minimal local purchase of machinery. You try to support the locals but they are always fairly dear. I suppose they are doing it tough and are not selling as much as they could or should. There are some wonderful things there, but a lot of them are not targeting local farmers. There is a rural supply shop in the area, chemical and herbicide and fertiliser places, but when it comes to machinery, hydraulics, trucks and spares there really isn't anywhere in town for that.*

Horticulturalists were having difficulty finding seasonal labour: 'It's hard to get labour in this vicinity because it's a new venture that no one has much in the way of skills to handle the horticultural stuff. A lot of it is pretty much no-brain work, but getting the sheer numbers and people to stick at it is an issue'.

### *The central business area*

One project participant provided an overview of business in the town:

*To look at the positives and the negatives of water trading, we really do have to understand what water trading does to communities. Because I live at Boort and work in Kerang, I always compare the two places. Boort has taken a big dive in local businesses in the last five years. People are dealing in Kerang and Swan Hill and Bendigo and Cohuna. Because Boort has the olives, everyone thinks that it is fantastic, but they don't look further. In 10 years' time they might have a big olive grove there, but they might not have any business community. People see Boort as the shining light, and they just don't understand that poor old Kerang is not really poor old Kerang. Boort has had development and water trade come in, but what has it created? Has it helped these businesses? Has it*

*helped the community? Has it helped the town? Kerang is a town that has had water trade go out, yet it has got business development, it has growth.*

When other participants were asked about the impact of water trading on local businesses, one replied:

*The International tractor place in Kerang closed recently. That's probably more the drought that finished them off. Kerang has traditionally been a pretty solid sort of place. We're on the edge of the Mallee, and irrigation, dairy, prime lamb industry is very strong around here, or it was. The water trading has killed that off. I know that the local stock agents are really feeling it. A mate of mine is actually worried about his job. All he does is handle sheep, but he hasn't got sheep to handle anymore. The drought has obviously made it worse. Kerang was quite a major lamb producing area once, from irrigated annual pastures. It's just not worth it any more. They can make more money trading water permanently than they'll ever make out of sheep. I was looking at Google Earth yesterday and it was just amazing how little irrigation was left in the area. Drive up the highway now and what used to be irrigation, there's nothing there.*

Participants were also asked to identify any factors other than drought and water trading that have affected the economy. One responded:

*In the long term I guess you would have to say loss of services generally. There used to be a big electricity place here and a big Telstra depot, so we've lost those people. Downturns in the dairy industry; commodity pricing is the other one generally. For every broken-down dairy farmer, I could show you a rich one. There are still plenty of farmers who are well organised, well managed, very efficient. At the moment there are huge opportunities around here. The fact that we have 95 per cent water allocation; hay has gone through the roof. You can sell a small square bale of hay now for \$12. That's in the paddock; you don't even have to bale it. A small square*

*bale of lucerne hay is selling for \$25 to horse people in Melbourne.*

One of the service providers observed:

*Kerang does look prosperous, and it is prosperous. Because of the water, the irrigation, everything is green and lush. Lots of people are coming up from the cities to retire. But drought impacts on that; businesses are floundering because they become the third bank. Mum and dad businesses have to collect on bad debts, so they go broke. So the empathy that the business people have for the farming community is huge, but then they don't have the business acumen to be hard-nosed and ensure they survive.*

The impact of the unbundling of water on shire rates was a concern for residents. One said:

*The unbundling is going to have repercussions on the shire. Fifteen to 20 per cent of their rate base is going to disappear overnight because they will no longer be able to rate properties on their water value. As water gets transferred out, the valuations of the properties change. The townspeople will have to carry a far greater rate burden.*

An examination of rate income from the farming community revealed that the loss of water had already had an impact. The shire representative explained:

*Rates for the shire are 41 per cent from farms, 31.6 per cent for irrigation and 9.3 per cent for dryland. Those figures are based on irrigated farmers getting a 17 per cent differential, so that they pay 83 per cent of the general rate. And that's up a bit from last year, which was a 14 per cent differential. So last year it was 47.4 per cent, 35 per cent per irrigation and 9.7 per cent dryland. Not a huge difference, but certainly there has been shifts in the values with less permanent water included as part of the rate base.*



## The community

A financial adviser highlighted one social impact of water trading as being farm succession planning:

*Most farmers have pressure coming from the past, present and future generations. Those in a strong position have established succession plans. But the trouble is that permanent water is so expensive that the price interrupts the planning. Farmers are so busy running to catch up because they have got somebody breathing down their neck. Banks need to take the pressure off, to set aside debt so that farmers can then generate cash flow and have the resources for better management.*

*Then again, I had a phone call from a son saying, 'Dad has just sold all the water—\$3 million worth of water'. Paid off all the debt and bought a Winnebago. How can a son buy \$3 million worth of water!*

*We need to be really creative to support farmers. I recall going out to a dairy farm and these people couldn't do it anymore; they had got to the end of their working life. But they couldn't sell their farm. It had been on the market for two years. And so they said, 'Look, we haven't got a choice; we will just have to sell the water. The farm will just sit there and go to waste; but at least we will be out of debt and have somewhere to live'. They were devastated to have to do that, but where else could they go? So I suggested that they lease the farm to their neighbour for a dollar. The neighbours pay the insurances, council rates and water rates and leave the owners with a house to live in. So at least the farm has stayed on the market and it looks good. They couldn't afford to milk, so there was a deal done with the stock as well. As in the wine grape industry, people can't afford to do it anymore. If they have a contract with the winery, then lease the farm to someone who can do it. They're not making money, but you can have happy people.*

*Say you have a \$200 000 debt on the farm. The family can go out and get jobs. That \$200 000 debt is the same as a home loan for someone that has a job in town. I have*

*been able to go to the banks to restructure the debt, extend it over 30 years and get a lesser interest rate; pay that monthly and it's the same as a home loan. So that's what I'm saying, 'Think outside the square'. The farm is not ruined. This person doesn't go bankrupt and the status quo is maintained. And then when the droughts are all over, the rains are back, then in five years' time we revisit.*

Lakes in the district were highly valued as a social and recreational outlet. Lake Merran, a popular attraction for tourists, had dried up. It had not been dry since 1850. One farmer noted the impact drought and water trading had on access to the lake:

*The only blessing is that it's quieter without all the speedboats. But the water licence has doubled since it became dry. The cost has increased from \$800 to \$2030 to fill it. Even if it is paid there is no assurance of delivery. And if they put in environmental flows, I doubt if they will allow speedboats.*

Another participant demonstrated how much water coloured people's lives and thinking:

*At a meeting about the state of the river in town ... we wanted something done because it's choked with rubbish and willow trees. And during that meeting, because we had all these government people there, an elderly lady stood up and said, 'This is nothing to do with the river but we've got to do something about permanent water trading. It is a terrible thing'. Why it should worry her I have no idea, but because there was a forum available she took the opportunity to say permanent trade is a bad thing. Water is in their minds all the time.*

Health service providers in the region said water pervades every aspect of service delivery and program development for people in the district. Furthermore, service delivery needed to take account of the fact that water and drought affected each community in different ways. One provider said:

*To quote John Humphreys from Monash University, 'When you know one community you know one community', and for each of our communities their issues*

*are their issues. Within that context, the ways in which community identity, their sense of belonging and social capital is sustained, maintained and even strengthened is unique to each of those communities.*

## Discussion

Kerang's central business area and the industrial estate are impressive. Although some of the retail businesses—the clothing retailers—were starting to feel the effects of drought, the secondary industries were doing well, competing in national and international markets. In addition, the number of businesses in the town has grown. Much of the drive and enthusiasm in Kerang can be attributed to a confident, proactive council. This is an example of how individuals in a community can significantly affect the way their community experiences and perceives change. Council's role in assisting agricultural businesses such as the Brown Brothers vineyard and establishing the cherry orchard is an example of that enthusiasm. These ventures maximise the use of water trading.

The crops are doing well, which confirms that the land in the district can be very productive if farms have access to water. Kerang people strongly resent the assumption that their land is less productive than land further downstream. This is accompanied by a fear that, with future water shortages, the trend to send water to places of 'higher value' will mean the eventual closure of the ageing irrigation infrastructure in the district.

There has been a pattern of trading water out of the Kerang district for many years, which has helped to mitigate problems with salinity in the region. Perhaps this is why the community has adjusted to some extent. There is still great resentment of the continuing trade in permanent entitlements out of the district among residents, particularly as drought intensifies and more farmers are forced into selling their entitlements. The negative impact of the trade is that it leads to a loss of productivity and subsequently a loss of people from the district.

The town itself is not as cohesive as other small communities as a result of the presence of different groups with differing values. Yet the community is able to present a united front when faced with major difficulties such as preservation of the health of their river and wetlands, which are highly valued. It was interesting to note the degree to which the question of water was at the forefront of the lives and minds of the people of Kerang. Loss of people from the community—particularly young people—was also a concern for almost every person interviewed, although this is characteristic of virtually all rural communities.

## Community views in Cohuna

Picturesque Cohuna is 20 kilometres south-east of Kerang and 265 kilometres north of Melbourne. The regional centres of Echuca and Bendigo are an hour's drive away. The town has a population of about 3000 and is in Gannawarra Shire.

Cohuna is bordered by Gunbower Creek, which is an anabranch of the Murray River. Gunbower Island, a flora and fauna sanctuary, lies between the Murray River and Gunbower Creek. The island is 50 kilometres long, stretching from Koondrook to Torrumbarry Weir, and is characterised by swamps, river red gums and box forest. Red gum timber has been milled in the area since the 1870s.

A focus group was held with some local residents, and interviews were conducted with others in the district.

## Economic profile

Dairying is the main agricultural industry in the area, but there is also pig, cattle, wool and timber production. A number of businesses in the town service the agricultural industries. This includes irrigation equipment and supplies, concrete and plant hire, dairy equipment and supplies, and water trading.

## Community services

Cohuna has three churches, a secondary college, a primary school, a retirement village, a hotel, two motels, a caravan park, a golf club and several sporting and recreational facilities. Banking, financial and legal services are also available. The town is fortunate to have a new hospital and continuity in medical services: doctors have been resident in the community for 20 or more years and are skilled practitioners, which allows many procedures to be performed locally.

## Community profile

### Community strengths

Focus group participants exhibited a strong sense of community pride. When asked what the best things about the town were, one farmer commented, 'This is a strong community. Good schools, strong sports clubs and historical society, good hospital, jobs in town. Next year we are going to be up 10 kids at the school, rather than being down 30 kids'. Another participant believed a relatively stable economy (to date) was Cohuna's strength: 'I think dairy farmers are a bit unique in the fact that they are nearly guaranteed a set income. You go into cropping or something; it's just a sort of a gamble really. You sow grain and you don't know whether you'll get a dollar or not'.

Employment was also strong in Cohuna. A farmer said, 'There are so many off-farm jobs around Cohuna. All the people who provide farm supplies employ people, and a lot of them aren't skilled jobs either. If a community is to survive there must be positions for those who don't go on to tertiary education'.

### Community cohesion

Residents described Cohuna as a close-knit community of people who are very supportive of each other and the local businesses. One farmer said:

*I came to this area 10 years ago, and you find with a dairy farming community it's special. For a start they get out of bed ... they are creative, incredibly hard working, they've learnt to think out of the square as you know with water trading, they have grown olives, and they are supportive of the businesses in this town. It's just, well, special really.*

A businessman added, 'We don't need to be here at all and there has been lots of pressure from time to time from the family to move to a bigger centre, but it's the little things that go on that make a community'.

### Community problems

Crime was not a concern in the area. The population is stable, but the local economy is feeling the effects of drought and close proximity to large regional centres. As a service provider noted, 'Cohuna suffers somewhat with the close proximity to the large regional centres of Echuca and Swan Hill, both being an hour each side of the town. But it also heightens recognition that we need to look after the community here'.

One of the farmers observed that Cohuna suffered from a lack of career opportunities and the loss of young people, who go away to university and rarely return. But he pointed out that this was common throughout rural Australia. He continued:

*I'd rather my kid—if he wasn't going to go to university—be in Cohuna than Pyramid because there you can only work at the pet food factory or abattoir. I don't know if I'm being a bit elitist, but working at an irrigation infrastructure industry is better than an abattoir. It's so easy to blame governments for things: it's their fault that the train line closes, etc. But I think we are so close to Echuca here and its a thriving tourist centre, there is a lot of work around this area. You can look at negatives wherever you go. For example, if it stays dry another 12 months then, so what, I'll go do something in Echuca. Got a nice house, got a nice spot here, and I'll just go do something there. Its only half an hour away.*

## The impacts of water trading on the farming community

The Cohuna focus group revealed serious concern about the rising cost of water and the impact that was having on local producers. The presence of managed investment schemes in the market was seen as the primary reason for the increase in the water price. A local business owner, who was also from a family farm, described their position:

*We are in the situation financially where we have to sell water in order to keep the farm. Now that's the just the way things are with the drought, commodity prices. The cost of having water has just been blown out of the water. Our water bill is probably \$70 000 this year, and we haven't had a drop of water. We haven't had a decent water right for years. So you simply stop operating. Because a farmer may have to sell the water to provide a house for himself in town when he walks off, it's grabbed up by these big corporations. If it gets to the stage where it's open to anyone ... we will lose control of our commodities.*

One of the local business people observed:

*If temporary water gets to \$350, farmers can't make money. Equity is going out of farming: in some cases it's down to 40 per cent due to the cost of water. Permanent water is worth more than actual land. And if we don't have the water you are basically farming semi-arid land. Net water use in the district has increased but it's gone out of the district and is now coming back. There is a loophole where you can get it back and not pay the channel fees, although the new charge of \$22 is coming in to cover that.*

A service provider noted:

*I don't see how people can be expected to pay for an allocation they don't get. I can't see how people can be expected to continue. Only a short time ago you purchased land and the water was thrown in: it wasn't even a valued commodity. Now it's the other way round.*

*Water is more important than land. To sell water is like selling your farm. To sell off water that enhances the productivity of the farm in time will have a negative impact on the local community.*

One of the participants said that, before the tariff changes with Goulburn–Murray Water, there was an incentive to buy land without water because there were no fixed charges and water could be brought in temporarily. Now, with tariff changes, the dynamic has changed, and people are more interested in water rather than land. A local real estate agent said:

*Just as an instance of how valuable water is. The last couple of years most inquiries have been about properties without water because of the trade. Now every phone call we get is, 'How much water is on the property?' It's so reliant on the water. Last year you could buy temporary water for \$55. It's now up to \$400. If someone's used water, the amount they have used you could buy back and put on the property and say its got a full water entitlement, sell and you could achieve the extra money that you've bought the water back for. That's how reliant it is. That just typifies it—no water, no district.*

Another participant pointed out that the impact of water trading was exacerbated by several other factors:

*The trouble is you've got economic factors, but drought first and foremost is causing us to have this discussion. We wouldn't be having it probably if it weren't for the drought. It would be another five or 10 years down the road before water trade itself became an issue when farmers who had a need for more water than they are getting could not buy it any more.*

Another added:

*It doesn't matter what price the water is if there is no water there. I have noticed that the farmers and their practices are a lot more efficient. They are growing grasses nowadays that respond quickly with water so they aren't wasting water any more. If it rains and there is water available it will help. They can cut their costs*

*and have extra production because of the things they have learnt through this drought. I think rain is the key to the whole thing.*

Asked if they would have experienced the same extent of drought in the absence of water trading, the group was silent for a while. Then one member replied:

*I can't answer that because for years we have lived on the need to have more than our basic entitlement. If entitlement for areas of property being irrigated was insufficient to produce an economic return, farmers have bought double their entitlement. Suddenly it can no longer happen. Farmers were able to buy water plus extra at a fairly low price. But slowly it's bid up and up and now it's reached the point with what little water is in the system that it will be better to keep olive trees and almond trees alive than it will be to run permanent pasture.*

Another agreed:

*Farmers have got very efficient, but there is room for improvement in the way water is moved around the countryside. There is a lot of water lost from channels and some of the structures holding water. The government should have built more dams. The government have done some terrific things like re-use systems, incentives for pipelines, but the only thing they haven't done is controlled where water has gone. The pipelines coming in now put water instantly in your paddock. Most people say it's a 10 per cent plus saving in water. So that's a good thing. The bad thing is there is no direction. The farmer can sell, can't hold. I don't know how we keep water in the district. We've had terrific incentives from the government to improve water savings but no one's thought about the trade. Why couldn't we start? If it had been held here, could we have grown olives, could we have grown the equivalents to where water is going to?*

Participants were asked if they were optimistic or pessimistic about the future of their district. One responded:

*Probably a little bit of both. On 100 per cent of water right last year we had 40 per cent sales. Farmers have learnt*

*to adjust. They are a pretty good breed; they do adjust quickly to change and they do work together and help one another. The 100 per cent water right isn't enough to make it and, depending on debt, it's not enough for a dairy farm to stay viable. The margins are too short. There are different allocations for different areas, different-sized properties. Last year most farmers would have used 40 per cent, and there was a lot of water traded as well. This year is back to 95 per cent sales and it's even greater. At 100 per cent it's not going to be enough to remain viable.*

## Perceptions of water trading

### The benefits

One of the farmers interviewed was positive about temporary trading for the community:

*A lot of temporary trade goes on here. I'm only one of many who are buying water. We all need it; we are all in the same boat. Productivity only comes from milking more cows, and to do that you need to grow more feed and to do that you need more water—simple economics. I think, for our community, trade brings great benefits to our town.*

There were negatives as well as positives associated with permanent trading:

*If I was living in Pyramid I would say trade is terrible because water goes out of there and comes to areas like this. A lot of water has gone from this area as well, downstream to Robinvale and the like, who are doing a great job. There is a lot of water being bought to grow grapes and olives, but I'd love to see where their markets are. I wonder how much is being bought by the superannuation funds and the like, who sooner or later are going to have to prove to shareholders that it's been a sound investment. I can see water coming back. Well, everything goes back to normal patterns, doesn't it? Show me where the wine market is. I can go and buy*



any number of \$2 bottles of cleanskin wines. You can't tell me they are making any money on that from their \$1200 a meg permanent water. We are a small nation, and the only place to sell that wine is on the export market. We are not going to wash in it. There must be a ceiling in wine production, and I think we are a million miles above that ceiling. And the same with olive oil: I don't have a bottle of that in the fridge and drink that every night; there has to be a ceiling on olive production too. If you have water you have to make a return for it, satisfy your shareholders if you are a public company, or yourself if you have a family partnership.

### The costs

One local agribusiness owner said:

*I'm a bit against the trading. I've just been reading a book about it at the moment—High and Dry. It talks about how free trade will cripple the agricultural industry. You have people in business come and buy water and essentially force the price up and farmers are not going to be able to afford it.*

One participant added that some farmers were also capitalising by playing the market. Another agreed: 'Looks to me that the government has just let it go to be the last man standing. The strongest person wins out of all of it, and the relocation of water doesn't mean anything to any district. It just means that it's passed on to whoever can afford it'. Another added:

*The big superannuation companies are encouraging people to invest in olives and grape vines and forests; they are getting a tax break out of it and they can afford to pay \$2000 a meg. The farmers aren't getting anything out of that. In years to come the super funds might decide to get into dairy farming.*

Market forces were seen to be out of control:

*We all know markets aren't perfect, but it's not a short-term fix, the market. But I don't know if there needs to*

*be a short-term fix. I guess if too much water goes and the infrastructure here breaks down then that is an issue. But how long are those managed investment schemes allowed to keep it before they make a profit on it? Sooner or later they will have to satisfy shareholders. It might be a diverse company with their fingers in a lot of pies, but you can't afford for too many of those pies to make losses. And unless they are making money out of their water then sooner or later they have to cut loose. And we are still here, a viable industry and we know we can make money on that water. Will that water come back at \$1000 a meg because there is going to be a lot on the market, big supplies meeting demand? You can see what's happened with the grapes: there will be grape water sold as permanent in the near future, you can just see it. So where is there any control? It's just absolutely willy-nilly. I really think that the government started the water trade and didn't envisage what was happening and now it's just escalated, and there are mountains of water gone out and now we're brining it back as temporary trade.*

One agribusiness owner added:

*My concern is the Federal Government needs to step in and take control of the whole situation, from water trade to new developments. Why allow all these new almond developments to go in if we haven't got water? They are taking it off people making a living in this area. My other concern is, is this a drought or a change in environmental conditions permanently? I read lots of environmental reports, and 90 per cent will say there is a shift in weather patterns. Is this drought going to break? I'm sure it will, but are we going to see a permanent change in weather conditions?*

A local business owner who was formerly a water trader suggested that there needs to be more control over the market: 'I was in trading water in the Goulburn Valley, and I mean it's money for jam. One farmer has 100 megs to sell; another wants to buy 100 megs. Facilitate that, get in for 5 per cent. I think the trade should be out of private hands and Goulburn–Murray Water should facilitate the whole thing'.

A service provider observed:

*I don't understand how it can be seen as a positive to open up water trading in dry times. It's a concept for when there are surpluses. There are concerns about drought and climate change. And there are concerns about access or accessibility of water and concerns the water levels are decreasing. It's not like people are sitting on huge storages.*

An associated problem with water leaving the area was stranded assets:

*One of the concerns that has been expressed amongst the farmers here is that water gets traded outside our system and away from land and the infrastructure that once may have served a number of end users ends up with just one. Water trading needs to be re-examined to work out whether it should or shouldn't go outside individual irrigation areas.*

The market and environmental flows were also raised by one of the farmers:

*There have been environmental flows for many years and it's never been a real issue, but rules seem to change. There have been environmental allocations that sometimes have been sold because the allocation isn't enough to spill the river. These are all things outside our control. If there are environmental flows that's fine: they have that entitlement just the same as I do. No one says to me, 'We don't have much water this year; we are going to have your entitlement'. It would be the same as me saying, 'Environmental flows; you can't have them'.*

The uncertainty of the water market and future allocations was a further concern:

*I think the biggest concern is the goal posts have been shifted all the time and that makes it very difficult for farmers to plan for the future and, from a business point of view, it creates so much uncertainty. I think there needs to be guidelines for where we are going, but this doesn't seem to be happening.*

A business owner agreed: 'Probably 90 per cent of our phone calls from farmers are to do with concerns about what the government may do next week, what restrictions will they put on us, what will they take off us. It's just that uncertainty'. Another participant said:

*Farmers are not sure of their share entitlement. If we call Goulburn–Murray Water and ask how you work through a share entitlement most times you get, 'I'm not sure'. We are trying to explain to people from Melbourne who have come up to buy land what a share entitlement is. And we are really battling. We say, virtually, if it's sold off you've got to buy that back or capacity shares to work the channel so that the channel is viable to supply water. Capacity shares are going to be a nightmare and next year they are talking about trading off stock and domestic. What does that say? Shut down the channel. And when they shut down the channel they shut down the area.*

## The impacts of water trading on the non-farming community

Participants were asked about the impact of water trading on associated agricultural industries as well as the local central business area.

## The associated industry perspective

Local businesses were feeling the effects of drought and water trading. An agribusiness manager said:

*Trading permanent water out of an area has just got to stop. We've lost business over the last five years. In another five years there will be no permanent water here whatsoever. If a bloke's got 100 acres and 150 meg he will sell that before he sells 100 acres with 20 meg of stock and domestic water allocations.*

A representative of a large agribusiness company advised:

*We actually run a water trading division. Over the last five years that hasn't made any money at all. This is the first year that it has just started to make money and that is*

*because the water price has gone up. The reverse effect of this is farmers aren't spending money on pipelines or outlets or anything else. We employ 50 people plus casuals. That's a lot of wages to keep going each week. We are travelling OK at the moment, but if this continues, there is no government regulation, what's the future hold for us? Fifty wages in a town like this is a lot.*

A dairy industry representative agreed: 'We employ people too. I'm worried about the farmers. It affects our business radically. The more farmers we lose, the less work there is for us'.

### *The central business area*

There were several representatives of the local business area in the focus group, and they all said business was currently doing quite well. But, with the economic future of the town in doubt because of the current problems facing the local agricultural industries, community leaders were looking to tourism and attracting an increasing number of retirees and sea changers who are interested in moving to Cohuna to sustain the town's economy. Land was being offered in small lots to encourage sales. There was some concern among residents that what they know and hold dear could be lost if action is not taken to redress the loss of businesses and people from the community. One participant explained:

*You drive into Cohuna and it looks like it's going very well. Cohuna is a very resolute place. The farmers have pride and want to carry on their traditions. Immediately you go past Kerang you drive past some pretty ordinary towns. Cohuna presents well. It's green, lush, a nice town; creek flowing through it, nice people, good sporting facilities, good hospital. We've got the lot, we really have. But with what's happening around us now, it will disappear very quickly if something doesn't happen, and we will be just like some of these other little Mallee towns. The business people keep all the sporting facilities going. So if the businesses struggle, sport struggles and the schools struggle. The government doesn't care. Victoria ends at the last hotel in Melbourne.*

One business person maintained Cohuna had a future but that it was up to the local people to make sure of that future:

*I believe Cohuna is going places. I think we are getting an influx of people coming here wanting to live here because of the lifestyle. But the worrying part of it all is there needs to be the infrastructure here for people to want to come here and, sadly and gladly, that's farming. We have some terrific industries but a lot of that work revolves around the industry. If we lose the nucleus, how can we possibly encourage other people to come here to enjoy the lifestyle that gives the football club the numbers? The whole fabric of our society is being battered. It's crucial for the next couple of years.*

*A study that came out of Queensland about small country towns and how they survive in adverse circumstance found that the towns that survive have nothing different from those who died except the people were in them were more optimistic, more outgoing, travelled more, education levels were higher, and they had a constant reminder that the world is going on outside them whether they liked it or not. The statement was, 'Our town doesn't have to exist for the same reasons it used to exist'. If we are to prevail over what is going on here, it will be up to all of the people in the community to actively pursue what we are talking about. If there is a wrong being done in water trading then that has to be brought to the attention of people who know. We can get to Kerang in 20 minutes and to Melbourne and back again in a day, easy, and once upon a time you couldn't do that. We used to have all these little towns and they don't need to exist anymore. And Cohuna won't need to exist unless we make a need for it to exist. We can't expect others to do it for us. We have to do it ourselves.*

### *The community*

Most participants saw the loss of farm families from the district as one of the main social impacts of drought and water trading. One farmer noted:

*In the 1970s the average farm herd was about 80 to 85 cows and I think it's 240 at the moment, so that's three farms gone. That's pretty much the norm. Over the last five years a lot of the share farmers have gone. The costs of share farmers have to be put into buying extra feed and extra water to keep herds together.*

Another added:

*Along my road the school bus doesn't stop now. It used to stop four times. That's 13 kilometres of road. Farms have amalgamated and kids have left and are not coming back. I'm also noticing that a lot of the next-generation farmers have had to move to find work somewhere else. It would be interesting to know what the average age of the dairy farmer is around here now. I can guarantee it's probably 50 or 60 years.*

Another participant observed:

*If the irrigation declines then those jobs are gone, aren't they? Cohuna will be gone—well, it won't be gone it will be a retirement village. It's a lovely little town, so there will always be a Cohuna. Drive up the river and find another area like this now. There aren't any. Because the irrigation is so close, the river is everything, but take the water away and we are in serious trouble.*

One service provider was most concerned about depression in the local farming community and was seeking funding so that a drought counsellor could work in the district:

*I'm really concerned about mental health in the area. I've desperately tried to get beyondblue or some other organisation to come into town. I was told to reapply next year. That's not good enough. We need something in this area—whether it's done in a small group, a barbecue, or one to one, or an open forum.*

Her concerns were echoed in the comments of an agribusiness representative:

*Because of the drought our workers become like counsellors. I actually had one of my men come back in tears and said, 'You need to go out and see this bloke.*

*He's talking about taking his own life'. We went out a couple of times and just listened, and we got him through it. I think it will happen more. There are a lot of people who have done up dairies and have to buy more water and they can't and this is going to ruin their business. And it's just the price of water. I'd just like to see the water stay in the area and be capped.*

A district health service provider noted that the loss of population can have serious ramifications for communities:

*In Pyramid Hill—the fact that the population base there is decreasing, they are losing services. We provide GP services 1.5 days a week, and that's in question because of the viability and demand for that. The reduction in those services is going to significantly impact on that community, and people will have to travel further for medical services, and that will have economic ramifications for that community. Those are the sorts of issues, which are visible in a smaller community like Pyramid Hill, that we are starting to see in Kerang and Cohuna. The GP in Kerang who provides obstetric services is no longer prepared to continue those services due to current demand. So that brings into question the capacity to provide obstetrics to Kerang, with a population of 4000. And that has an impact on that community which flows on to neighbouring towns. It also impacts on midwives employed in local hospitals, and that has further economic and social impacts. GP vacancies continue to increase and doctors start identifying what they will and are prepared to do, which means there will be changes to the suite of services a hospital can provide. And that means staffing changes and when farmers are requiring that second off-farm income, it can be a double effect for those families.*

*We have been working with Gannawarra and Loddon Shires, getting them to understand that the whole concept of replacing a GP has social and economic consequences if that position remains vacant, so that they might be more involved in recruitment and retention strategies. There is not much financial support for attracting and helping new doctors and their families to enjoy living in the community.*

*Where you don't have a doctor, as in Pyramid Hill, there is question about continuing the aged care facility. In many of these small communities where there aren't lifestyle things like cinemas, the only reason people stay is because it's cheap and there is access to medical services. But if those services go, people have to travel to seek medical help. Then there are all those issues with lower socio-economic groups being able to travel. There is a need to appreciate the value of maintaining existing medical services because ... losing such services has dire ramifications for the local community.*

Another social impact for the town was outlined by a representative of the local golf club, who described the impact of drought and the water trade on their grounds:

*We just made a decision to spend \$40 000 on partial permanent water and temporary water on the basis that we figured that we could afford to do it. We don't want to do it, obviously. We should have bought permanent water several years ago when we had the opportunity but we left it until it is nearly impossible. Dumb decision, but we are still managing to present the course in attractive condition. Memberships are lousy. Football club membership is lousy. The cricket association disintegrated, but that's fairly typical of all country centres. I've been to a number of meetings of golf associations and they are all in the same boat. Rural communities are declining for a number of reasons, such as the loss of young people and because the drought has been going on for quite a while.*

When asked if these changes were a result of drought or the water trade, one participant replied, 'It just goes hand in hand. Which comes first, the chicken or the egg? What it's all about is the lack of water and where it's going to'.

## Discussion

The general mood of the focus group was pessimistic. As participants said, the town does look vibrant. It is in a beautiful setting by the river. There are new housing

developments, and there is a movement into the town of retirees from the city. This is a longstanding traditional farming community, and the residents are very proud of their town and the environmental setting. Consequently, there is a strong attachment to place and a high level of community cohesion, and the residents do not want to lose what they hold so dearly. They perceive water trading to be a threat to the stability of their local industry and ultimately to their town structure. Community leaders were looking to tourism and attracting an increasing number of retirees and sea changers interested in moving to Cohuna to sustain the town's economy.

The residents have a sense of a loss of control and helplessness in relation to the changes happening around them as a result of the trade of water out of the community. There is a recognition that it might be up to them to reinvent their town, focusing on tourism and building an attractive retirement location for retirees from the city. As one resident said, 'Cohuna won't need to exist unless we make a need for it to exist'. These structural changes will, however, come at a cost to the people and the dairy industry that they know and love and that defines who they are. Such changes require community leadership and energy.

Drought also saps energy, and the residents are at a low ebb. If structural change has to take place, this community—like many others in a similar position—will need financial and physical support and encouragement.

## Summary

Water trading has had a big impact on Rochester, Central Goulburn and Kerang–Cohuna in the past decade or so. Rochester was a buyer of water entitlements in the late 1990s and early 2000s but has sold large volumes of permanent water in the past three irrigation seasons (2003–04 to 2005–06). Water use in the region has not changed dramatically because recent sales of water entitlements have been offset by purchases of water allocations from other regions. Irrigation in the region is predominantly for



dairy farming. Until the past three irrigation seasons Central Goulburn had bought and sold small (net) volumes of water entitlements. During 2003–04 to 2005–06 larger volumes of water entitlements were traded out of the region. Kerang–Cohuna has consistently sold water entitlements and bought water allocations since the late 1990s. Dairying and mixed farming allow for diversification between irrigation and dryland agriculture.

A range of factors were seen as contributing to the observed patterns of water trade in the region. For example, the input and output costs of the dairy industry have been a key influence in the patterns of trade. Further, many dairy farms in the area were geared towards using more than 100 per cent of water allocations when sales water was available. Lower allocations in recent years have thus meant buying water on the temporary market, buying feed or reducing production. Additionally, the irrigators in Kerang–Cohuna are part of the Murray system that is upstream of Sunraysia—where the development of greenfield sites by managed investment schemes has increased the demand for water.


Irrigators in the region perceive a range of benefits and costs associated with water trading. On the plus side, they recognise the ability of water trading to help them manage their capital and adjust their cropping activities, as well as assist with cash flow, liquidity, and debt and drought management. On the negative side, irrigators expressed concerns about depopulation of their region, the risk of stranded assets, institutional risks, and the potential build-up of pests on vacant land.

Being an importer of water over many years allowed Rochester to expand its dairy industry. But recent trade out of the district, significant reductions in water allocations—at the time, 22 per cent within the Campaspe system—and the subsequent loss of productive irrigated agriculture in the district is a major concern for residents. Now structural change is occurring in the district, and residents fear the loss of more people from the area. The town of Rochester, with 2600 people, is a service centre for a large dairying area and the location of several support industries. The surrounding district traditionally is totally dependent on

agriculture. As a result, drought, deregulation in the dairy industry, and water trading out of the region have greatly reduced incomes for businesses in the town. A large dairy factory that is an important employer recently stood down some workers. Ultimately, loss of population could lead to loss of community services such as health services.

In Central Goulburn drought was the primary cause of effects on the economies of the towns of Kyabram (population 5500) and Tatura (population 3000). In Kyabram, water trading has led to the establishment of water broking firms and an irrigation supply company, but it has also been associated with the downsizing of an engineering company and the closure of three canning factories in the district. Tatura has not experienced any major loss of industry, although recent tightening in local industry practices and reductions in employee numbers were a concern. Water trading has allowed dairy farmers to trade water out of these areas, and project participants were well aware of the negative impact that can have on a community. The towns' proximity to the regional centres of Shepparton and Echuca has led to a growing number of hobby farms as farmers leave the land. There is concern about the loss of production, the social structure of the communities, and the environment.

In the area around Kerang (population 4000) the balance of dryland and irrigation-based industries contributes to economic stability. Crops are doing well, which confirms that the land can be very productive if farms have access to water. The town's central business area and industrial estate are impressive. The industrial area, in particular, is growing, with some substantial industries supported by an enthusiastic, proactive council, although most of this growth is independent of the water trade. Nevertheless, water trading has allowed the council to facilitate the development of horticultural businesses, such as the Brown Brothers vineyard and a cherry orchard. Drought and the sale of permanent water entitlements, on the other hand, are seen as contributing to a loss of farms and people. The sight of previously productive farmland now dry and often in a poor state was demoralising for residents. In particular, the exodus



of young people was a concern for almost every person interviewed, although this is characteristic of most rural communities.

Nearby Cohuna (population 3000) lies in beautiful surroundings beside the Murray River, adjacent to Gunbower Island. The town has been built around a long-established dairy industry, and among the residents there is a high level of attachment to place. The residents see the water trade as a threat to the stability of local industry and ultimately to their town as more water is traded out of the region and more dairy farms are sold. To sustain the town's economy, community leaders were looking to tourism and encouraging retirees and sea changers to move there. Residents feel helplessness and a loss of control in relation to the changes that are occurring.

There was an awareness that some adjustment might have to occur, but there is a sadness and resentment that it should be necessary.

In summary, the case studies brought to light a mix of views about the impacts of water trading: it can help the dairy industry expand during profitable times, but there was also widespread concern about the consequences of changes in land use associated with trading out in other times. Many project participants also had difficulty untangling the effects of water trading from other factors such as drought, dairy deregulation, and the trend to farm aggregation.



## Appendix A: The consultation methodology

### Fieldwork objectives

The aim of the fieldwork was to gain an understanding of the social and economic impacts of permanent and temporary water trading in the Victorian Murray Valley from the viewpoint of people living in the area. ‘Social impacts’ are defined as the consequences for human populations of an event that alters the way people live, work, play, relate to each other, meet their needs, and cope as members of a community (Burdge 2004b). The study was not a true social impact assessment, which is usually conducted in advance to assess the potential impacts on the quality of life of people and communities whose environment will be affected by a proposed project, plan or policy change (Burdge 2004a). Rather, the quest was to establish the social impacts that have resulted from water trading. The study sought to clarify the social and physical reality of water trading from the perspectives of irrigators, industry, business owners, community leaders, and ordinary residents in three irrigation regions—Sunraysia, Pyramid–Boort, and Rochester, Central Goulburn and Kerang–Cohuna.

People’s attitudes—their likes and dislikes in relation to objects, people, groups, situations, and any other identifiable aspects of the environment—are an important aspect of sociological research. They are often linked to beliefs about these same aspects of the environment. Furthermore, attitudes can sometimes be linked to actions taken in respect of such beliefs because

human beings generally strive to be consistent in their beliefs and behaviours (Atkinson et al. 1990). Farmers’ beliefs about drought, the farm’s viability, commodity prices and the future of agriculture will influence their decision to trade and their attitudes toward trading (Fenton 2006). The cultural mores that permit or proscribe certain behaviours pertaining to the trade were also identified in the study. In particular, the study sought to do four things:

- contribute to the understanding of the impacts and processes of water trading on farmers, local industries and communities
- identify the key factors in regions or industries or in the nature of trading that are likely to exacerbate or mitigate the expected impacts of the trade in comparison with other regions
- test the validity of the assumed benefits and perceived concerns of irrigators and the community
- provide a framework for monitoring the impacts of water trading from the farm, industry and community perspectives.

The study was carried out in the knowledge that severe drought had recently intensified in the area. At the time of the fieldwork drought assistance subsidies were extended to horticulturalists. Thus, although every attempt was made to disentangle the social impacts of drought from those directly attributable to the water trade, drought did affect participants’ responses.

## The case study communities

The research was conducted in irrigation districts on the Victorian side of the Murray Valley—Pyramid–Boort, Sunraysia, Campaspe, Central Goulburn and Torrumbarry. The communities selected for case study within these irrigation districts were:

- Sunraysia—Mildura and Robinvale
- Pyramid–Boort—Pyramid Hill and Boort
- Campaspe—Rochester
- Central Goulburn—Kyabram and Tatura
- Torrumbarry—Kerang and Cohuna.

Interviews for the Central Goulburn and Rochester–Campaspe Irrigation Districts were also conducted in the regional centres of Shepparton and Echuca. The case study communities differed in size, social structure, type of agricultural production, and the degree to which water is traded into and out of the area.

## Data collection

Data for the case studies are derived from secondary statistics, focus groups, observation and in-depth interviews. Two investigators visited the five districts over four weeks in October and November 2006 to do the fieldwork. In each district about 10 farmers were interviewed; a focus group and some supplementary face-to-face interviews were held in one of the case study communities; and in the others a wide cross-section of residents were surveyed. The questionnaires used in the interviews were of a semi-structured form to ensure consistency in reporting across interviewers. The questionnaires (which are available from the authors on request) were based on proven survey instruments used in social and economic impact studies previously conducted by the Institute for Rural Futures and modified to accommodate the topic of water trading. The first two days of the fieldwork were used to pilot the instruments. Very few changes were made, so the data from the pilot interviews were included. The questionnaires and the study design were submitted to the Ethics Committee of the University of New England for ethical clearance before the study began.

## Interviews with community residents

In one community in each district face-to-face interviews were held with a wide range of agencies, businesses, community leaders and residents:

- *Rural financial counsellors.* Counsellors provided their insights into the impact of the trade on farm families in the area.
- *Police officers.* Police officers provided an overview of the main types of crime and problems encountered in policing the community and whether there had been any changes as a result of water trading.
- *Community health workers.* These people provided an insight into specific problems emanating from water trading and any initiatives they had introduced to alleviate the problems.
- *Neighbourhood centres.* Managers of neighbourhood centres were able to provide an overview of community activities and support services available for farm families and workers.
- *School principals.* Principals provided insight into difficulties facing young people in the community.
- *Ministers of religion.* Ministers talked of the social problems they encounter in their parish and any measures taken to resolve them.
- *Editors of local newspapers.* Editors provided information on current concerns in their local community. They also provided newspaper clippings covering events to do with water trading.
- *Welfare agencies.* Representatives of various government agencies, including Centrelink, and volunteer groups such as the Country Women's Association, the Red Cross and St Vincent de Paul provided insights into the level of welfare need in the community in relation to the impact of water trading.
- *Town councils.* The Community Manager or Economic Development Officer was able to provide an overview

of the impacts of water trading on their community and any actions taken to mitigate those impacts.

- *Business owners.* Various businesses—pharmacies, newsagents, butchers, supermarkets, and so on—were contacted in order to gain an understanding of the impact of trading on the local economy.
- *Agricultural businesses.* Businesses supporting agriculture were an important indicator of the first line of impact of water trading. Among the businesses targeted were stock agents and rural traders such as Elders or CRT, surveyors, machinery manufacturers and sellers, and dairy and irrigation suppliers.
- *Bankers.* Bank managers and agricultural loans officers provided insights into the particular economic difficulties facing local farmers and businesses.
- *Real estate agents.* Real estate agents provided information about land transactions in the district as a result of water trading.
- *Water brokers.* Brokers offered unique insights as facilitators of trade as well as members of the community.
- *Industry representatives.* People from the district water authority offered their observations about what was occurring in their region.

Organisations in each community were initially contacted by telephone or email and invited to participate in an interview. Contact details were obtained from Telstra's *Yellow Pages*® and community lists of local businesses and by snowball sampling. Participants were asked to identify people the investigators should speak to. In addition to commenting on matters related to their specific organisation, participants answered a set of questions about the impact of water trading on their community. A total of 112 interviews were conducted.

The survey sought residents' opinions about the positive and negative aspects of their community, including their opinion of the community's cohesiveness and its ability to cope with change. Opinions about the costs and benefits of the water

market for their community, who benefits the most, and who is most disadvantaged were sought. Participants also responded to a number of attitude statements about water trading. Social and economic impacts due to causes other than drought or water trade were also identified. Information on the economic impact was elicited through questions relating to business start-ups and closures that had occurred over the past five years as a result of water trading. Business owners were asked what proportion of their business revenue was dependent on farm businesses, what changes in their sources of income had occurred in the last five years as a result of water trading, and what were the greatest risks to their business from water trading.

The time taken for interviews ranged between five and 90 minutes and averaged 20 minutes. With the participants' permission, the interviews were recorded. The transcripts of each tape were evaluated, and relevant information was extracted for inclusion in this report. The responses to closed-ended questions were entered into a database and statistically analysed.

## Interviews with irrigators

In-depth interviews were conducted with 33 irrigators, who were selected by snowball sampling. Prospective interviewees were invited to participate and given information on the study. The investigators visited the property to conduct the interview at the invitation of the participant. The length of interviews ranged between 60 and 120 minutes. Some irrigators were given a copy of the questionnaire and a reply-paid envelope to allow them to complete the survey at their leisure and return it to the investigators.

In the questionnaire some basic demographic data on the participants, their families, their farm operation and their level of involvement in off-farm work were sought. Participants were asked about their vision for the future of their farm business in order to assess the difference in attitudes and behaviours related to water trading between traditional farmers who intended to pass the family farm on to their children and those who viewed their land as a commodity to be sold on retirement. Their level of attachment to the community and their family networks in the district were also ascertained.



Irrigators' level of involvement in water trading in the past five years and the costs and benefits for their farm operation were explored. The irrigators were asked what alternative action they could have taken to achieve the same result if water trading had not been possible and, knowing what they now know about water trading, if they would make the same decisions again. Their plans for water trading in the future were explored.

Irrigators were also asked if there been any effect on their farm operation from their neighbours' or the government's involvement in the water market. Information about their level of equity in the farm business was sought. Any changes to their sources of income in the last five years and their asset base as a result of water trading were assessed.

The irrigators responded to the same attitude statements put to other participants concerning water trading, the costs and benefits of trading for their local community, and the positives and negatives of their local community.

The project brief required some case studies of irrigators, so at the end of the interview some participants were asked if they would allow photographs of their property to be taken and their information to be recorded in a book featuring the case studies. Those who agreed were asked to sign a consent form and approve the photographs to be used.

## The focus groups

Six focus groups were convened. These groups offered a means for assessing residents' views on the impact of water trading on their community in a group situation. The benefit of this method is that the interaction of group members can help with identifying and clarifying issues and in the process contribute to the knowledge of participants. The limitations of focus groups are the non-random selection of participants and the limited numbers of those who are able to participate (Stayner & Foskey 1997).

Participants were drawn from the *Yellow Pages*® and community lists of local businesses and by snowball sampling. Community leaders were identified and asked to provide the names and contact details of people who might be interested in attending a focus group. Potential participants were contacted by telephone

and invited to attend. Information about the study was then forwarded to them by fax or email. Invitations were also personally delivered to some businesses when the investigators arrived in the town.

There were six focus group participants in Mildura, 10 in Robinvale, 12 in Cohuna, five in Boort, six in Rochester and four in Tatura. Although efforts were made to have about 12 participants in each focus group, some groups were not well attended. The reasons given for non-attendance were the start of harvest and a distaste for discussing such matters in view of the widespread depression accompanying the strengthening drought. Nevertheless, the high quality of the discussion in the smaller groups compensated for the low attendance. Some additional interviews were conducted within the focus group community to fill gaps in the data collection and balance the information gathered in other communities.

Attendance at a focus group was taken as a participant's consent to be part of the study. Each participant was provided with a letter outlining the purpose of the study and advised that they were under no obligation to participate in the focus group, that they need only contribute to the discussion to the extent that they wished, and that they were free to leave at any time. Participants were also assured of confidentiality.

Each workshop was recorded. Permission to do so was obtained from participants before the start of the workshop. Participants were advised that the tapes would be destroyed once the investigator had completed the final report. None of the participants objected to the recording. The transcripts of each tape were evaluated and relevant data were summarised for inclusion in this report.

The discussions took on average one-and-a-half hours and were followed by lunch. Participants were asked questions similar to those used in the face-to face interviews with residents—about the positive aspects of their community, their perceptions of the degree of community cohesion, the problems facing the district, and so on. General discussion followed on the costs and benefits of water trading for irrigators and the community, including the loss or gain of local businesses.

# The participants

Thirty-three farmers and 112 community residents participated in the project. Of the community members, 56 completed the full survey. Of these, 42 were male (75 per cent), 13 were female (23 per cent), and there was one couple (2 per cent). They were aged between 18 and 85 years (mean 48.29; SD 12.14). Of the farmers, there were 23 males (70 per cent), four females (12 per cent) and six couples (18 per cent), and their ages ranged between 26 and 70 (mean 53.25; SD 11.56).

The farmers had been living in their district for an average of 42 years (SD 17.61) and had been living on their current property for between five and 70 years (mean 37 years; SD 19.37). They had been farming as an adult for an average of 33 years (SD 14.86). The greater proportion of farm businesses

(64 per cent) were family partnerships; 32 per cent were private or family companies and one was a public company. Just over half the properties (54 per cent) were previously owned by relatives of the participants. Only 16 per cent of the farmers were receiving income from off-farm sources.

Property size ranged from 11 hectares to 14 000 hectares (mean 1757 hectares; SD 3100 hectares). Figure A.1 shows the types of agricultural production.

Two farmers (7 per cent) had a river diversion licence, 22 (78 per cent) had a water right, and four (14 per cent) had both types. Figure A.2 shows participants’ activity in the water market.

Figure A.1 Participating properties: types of production

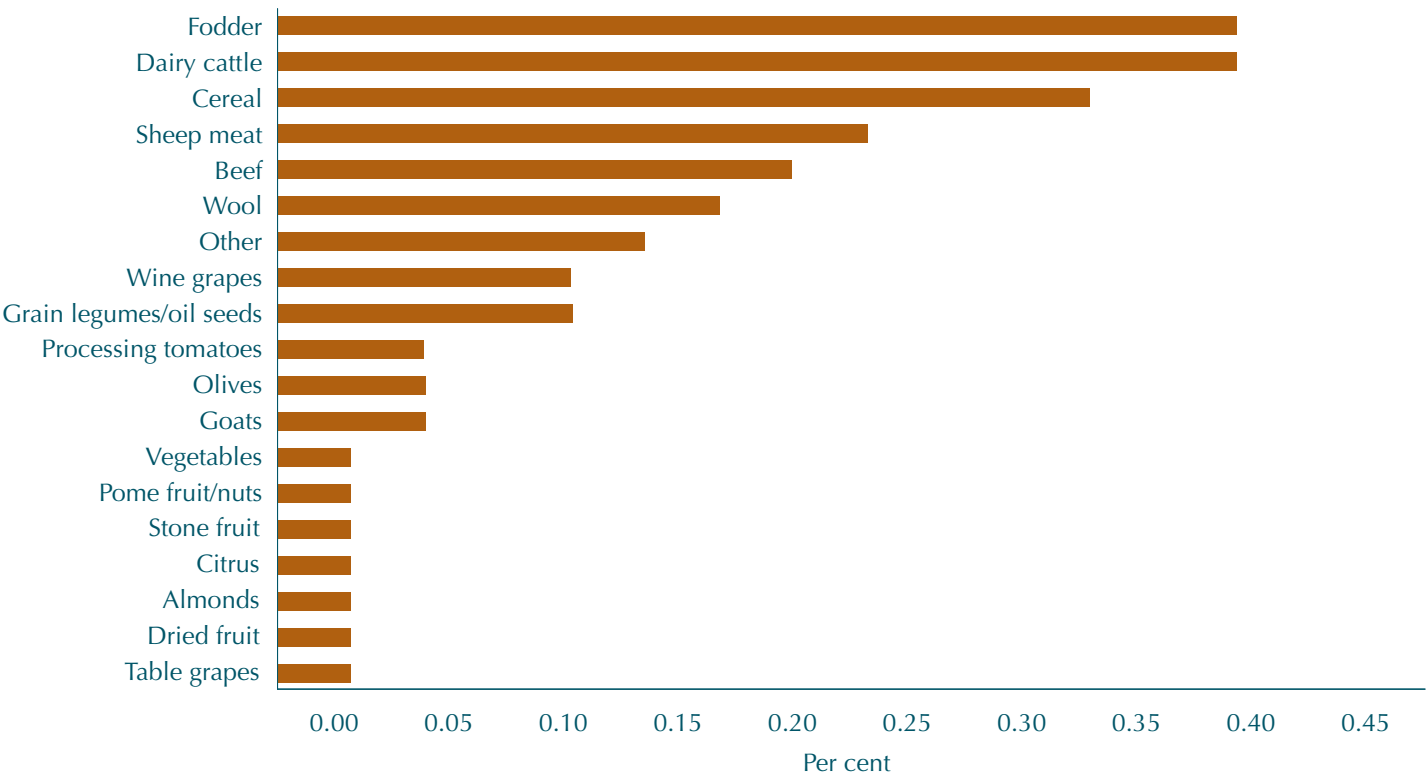
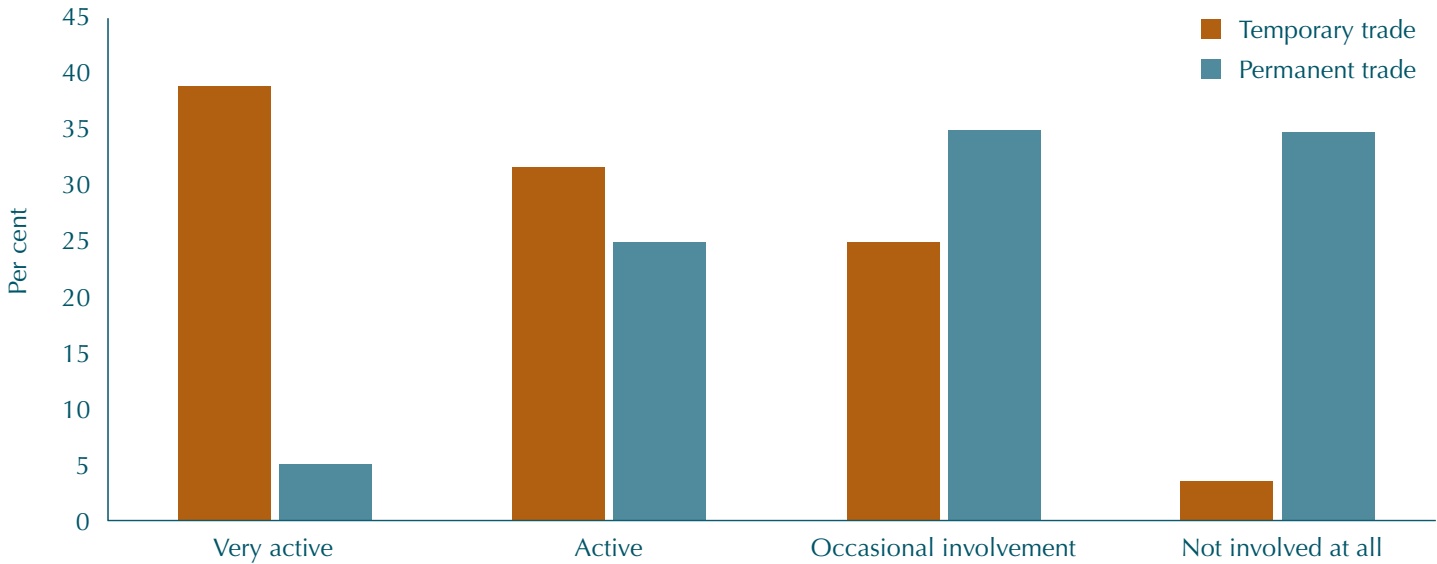


Figure A.2 Participants' activity in the water market





## Appendix B: Outcomes of consultation: perceptions and attitudes

### Perceptions and observable actions

The study also sought to identify the 'social construction of reality' (ICGPSIA 1994) as it pertains to water trading from the perspectives of irrigators and the residents of rural communities in the case study regions. Although some perceptions might be thought to be emotional or misinformed, they are important to include if one is to understand the social significance of the impact of the water trade on the behaviour of all those involved.

It is also important to note that no two rural communities are alike. Rural localities are defined by their size, social structure, geographic location and economic base. Even places closely matched in terms of these factors differ according to the types of individuals or groups of people that live there and the social mores they uphold. All these factors yield different structures, or nuances, in 'community' that affect the residents' experience of water trading.

Although rural communities are exposed to much the same media as urban areas, the human need to be a part of a community means individuals are influenced by the information they receive through their frequent and continuing interpersonal contacts (Festinger 1950). The risk of rejection compels individuals to hold and express beliefs common to the group. In this way, particular beliefs pertaining to water trading become common

rhetoric among residents. During the fieldwork certain catch-phrases unique to each community featured in interviews with residents. For example, in Mildura it was 'the critical mass, which was sustaining the community'; in Kerang the repeated concern was the loss of young people from the community; and in Cohuna people asked, 'Is this drought or is this climate change?' Accordingly, attitudes towards water trading can be generated and sustained within a community, and this can influence people's behaviour.

The close proximity of many Victorian urban centres also means that community boundaries are diffuse. Several of the study participants were working in one town and living in another. Furthermore, the need for off-farm work meant that a sizeable proportion of the people interviewed in the case study towns were from farms. Among them were teachers, nurses, public servants, business owners and journalists. As a result, certain perceptions of water trading prevail across communities in these regions.

Because of the proximity of urban centres, the loss of permanent water entitlements from the Pyramid Hill community is a constant reminder for the residents of neighbouring communities that water leaving a district can result in community decline. Almost all study participants recognised that water trading out of the Pyramid Hill district had a positive effect on salinity levels in the area. Even residents of Pyramid Hill acknowledged there

were areas in the district that should never have been irrigated. There is, however, acknowledgment too that water trading has negatively affected the social structure of Pyramid Hill, and this has created a sense of unease about the gain to some communities at the expense of others and a fear that circumstances could lead to other communities suffering a similar fate. Such concerns shape and condition attitudes and behaviours in relation to water trading.

## Cognitive dissonance

Cognitive dissonance is the uncomfortable tension that comes from holding two conflicting thoughts at the same time. The theory of cognitive dissonance sees those contradictory thoughts serving as a force that compels the mind to acquire or invent new thoughts or beliefs or to modify existing beliefs so as to reduce the amount of dissonance (conflict) between attitudes, emotions, beliefs or behaviours. In the extreme, people's mental health can depend on their being able to reduce the conflict between those different thoughts.

It was interesting to note that two of the water traders interviewed were morally opposed to the sale of permanent water out of a district because of the negative impacts on communities. They rationalised that their role was practical and necessary and focused on the positive aspects of trading for farmers—such as alleviation of debt and provision of options for retirement.

## Communal loss with personal gain

Many irrigators are deeply conflicted about the depopulation of rural areas. They speak with a sense of loss about the demise of the local footy club or the dwindling numbers at the local school, but in the next breath they speak, with justifiable pride, about the way they have survived in farming and how they have managed to build up their holding of land and water by buying out other farmers. They even let you in on their ambitions to buy more farms.

Irrigators are reconciled to the continuing amalgamation of properties. They know this means fewer farmers and therefore fewer people in the local area and fewer children in the schools.

Accordingly, irrigation communities rail against what are seen to be the underlying causes of people feeling they need to sell. At the same time, they have sympathy for those who can no longer continue in farming. At least, they have done this in the past, when the person being forced out of farming could be relied on to sell the farm as a going concern. In those circumstances property amalgamation was a familiar, if somewhat discomforting, part of the farming scene. The exit was mourned, and the purchase was made as dignified as possible. The change was also understood to be an opportunity for neighbouring individuals as much as it was a loss for the community.

Separating the sale of land and water changed this dynamic. It opened the possibility that the vendor would, in effect, cause irrigation to cease on that property. Not only would this bring about a net reduction in irrigation in the local area: it would deny the neighbours the opportunity to keep restructuring their enterprises to meet contemporary standards in operating scale.

In these changed circumstances, when there was no 'fire sale', what were the remaining irrigators to do with their sympathy? When the new dynamic first emerged, they withheld their sympathy. In all districts social norms emerged to guard against community members selling water separately from land. But this study shows that as permanent water trade becomes more common, as more friends and relatives are faced with the decision to sell, as more going concerns are sold to people who then sell the water and land separately, as more people do their own sums, vendors start to attract more sympathy. The resentment of those who feel betrayed, those who are used to doing business in different institutional settings, those who are suffering the opportunity cost of having to buy water and land separately if they want to expand their enterprises, is then focused on the institutional arrangements that put the vendors in this position.

## The prisoner's dilemma

In Pyramid-Boort in particular, but also to a slightly lesser extent in the other regions, the spectre of reconfiguration has converted this underlying tension into a situation analogous to a 'prisoner's dilemma'. Most don't want to sell their water separately from



the land, but if other irrigators start doing so they don't want to be the last on their spur channel to sell, because they think they might be forced to sell under a reconfiguration plan, which they believe would mean selling at a discount.

In game theory, the prisoner's dilemma is a type of game in which two players can 'cooperate' with or betray (that is, 'defect') the other player. The prisoner's dilemma is that rational choice leads the two players to both play defect, even though each player's individual reward would be greater if they both played cooperate. The dilemma illustrates a conflict between individual and group rationality.

In the real world of Pyramid-Boort, those irrigators that remain after each permanent water sale understand the attraction of defecting, but they put pressure on each other to cooperate. There are opportunities to punish non-cooperative acts:

*We had a couple on the Water Service Committee that traded—permanently traded—their water. And at the next election they were booted off. So I think there's a measure of what the community thought. And not only that but the community then got concerned because they thought, 'Heck, here's two of our representatives on the Water Service Committee. They've permanently traded their water. What do they know that we don't know?'*

The subtlety and sophistication of the dilemma is not well understood by the nearby townsfolk. They are affected by the ultimate decisions, but they are free of the burden of continuously weighing up the pros and cons of selling or staying.

## Attitudes to temporary and permanent water trading

Residents were asked their opinion about the advantages and disadvantages of both temporary and permanent water trading. Participants generally were very aware of issues surrounding water trading, largely because a high proportion of them were from farms. It was very evident that water pervades every aspect of the lives of residents of these communities and was foremost

in their consciousness. Each participant gave informed, considered responses to questions, even if a few responses were coloured by misinformation or social norms and values.

### Temporary trading

Overall, participants were very much in favour of temporary trading, primarily because water is retained in an irrigation district, a fact that was important to most participants. Temporary trading was seen to offer farmers flexibility, risk management, a means of sustaining cash flow, debt management (particularly in dry times) and business growth and development. Participants believed temporary trading made full use of the available water. For many dairy farmers who preferred to operate on 200 per cent of their water allocation, the temporary trade was of great benefit. The only disadvantage of temporary trading noted by participants was the current high cost of water. This they attribute not only to the drought but also to the presence in the market of large corporate farms, which create an 'unequal playing field' because they have the ability to pay any price. Consequently, some farmers, particularly dairy producers, are struggling to compete. Given the value of the milk produced, dairy farmers are unlikely to pay \$400 or more a megalitre for water. Horticulturalists on efficient drip irrigation systems are forced to meet the costs because their current and future viability depends on maintaining a reliable water supply to their crops. There is also a tendency for some farmers to prefer to sell water at these high prices because the returns outweigh those achievable through production, particularly in times of drought and reduced water allocations. This has the flow-on effect of reduced spending in local communities. Despite these disadvantages, in general participants concluded that the benefits of temporary trading outweigh the disadvantages.

### Permanent trading

In the Sunraysia region, where there has been significant importation of permanent water, the advantages of this type of trade were mentioned by a higher proportion of residents than in the other regions. There is very little temporary trade in the

Robinvale district. Overall, however, it became clear that there is an overwhelming rejection of the trade of permanent water entitlements outside an irrigation district, primarily because it is seen to be facilitating the loss of water from a region. This is followed by a loss of people as they retire or move away, which leads to a loss of production and subsequent effects on local economies and communities. There are concerns about stranded assets and the increased costs of supply to farmers who remain on a channel after water has been sold from the channel system. There are also concerns about the degradation of the channel systems as a result of the loss of users. Proposed exit fees to account for stranded assets were a concern for farmers who planned to sell their water to fund their retirement.

Permanent trading is blamed for the presence of large corporate developments, or managed investment schemes, in the marketplace, which has led to an increase in the cost of water. It is also seen as contributing to boom-and-bust cycles and profiteering by people who play the market.

One of the main concerns was uncertainty about future water allocations—not only because of drought or climate change but also as a result of policy decisions. The experience of New South Wales irrigators facing reductions in water allocations mid-way through the season was a reminder to Victorian producers that they could face similar problems. As Young (2003) noted, ‘The fastest way to decrease the value and the quality of any investment in resource management is to increase uncertainty’. Overall, participants believed that the disadvantages of the permanent trade outweighed any benefits.

### Attitudinal differences

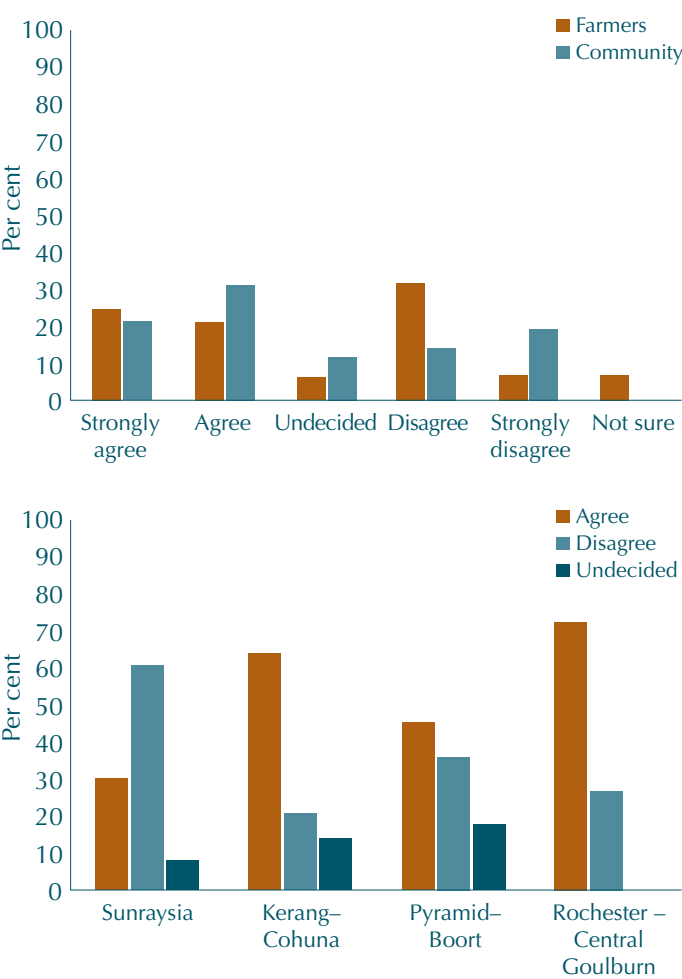
Participants interviewed for the study responded to 14 attitude statements about water trading. The responses were compared across regions and between irrigators and community residents. Since a focus group was the primary means of data collection in the Rochester area, the responses from participants in Rochester and Central Goulburn are combined. Kruskal–Wallis tests for comparisons of independent groups compared responses between irrigation districts and between farmers and community

members. For the regional comparisons, response categories were combined for ‘Agree’ and ‘Strongly agree’ as well as for ‘Disagree’ and ‘Strongly disagree’.

### The attitude statements and responses

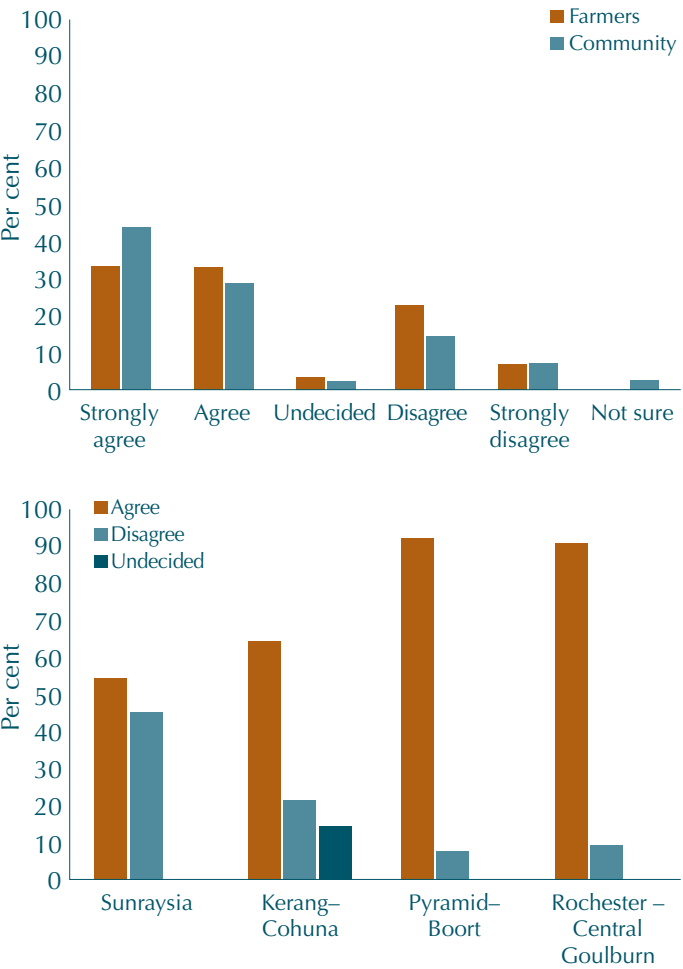
*‘Water rights should not be sold separately from a farm’*

Respondents from Sunraysia tended not to agree with this statement; respondents in the other districts strongly agreed.



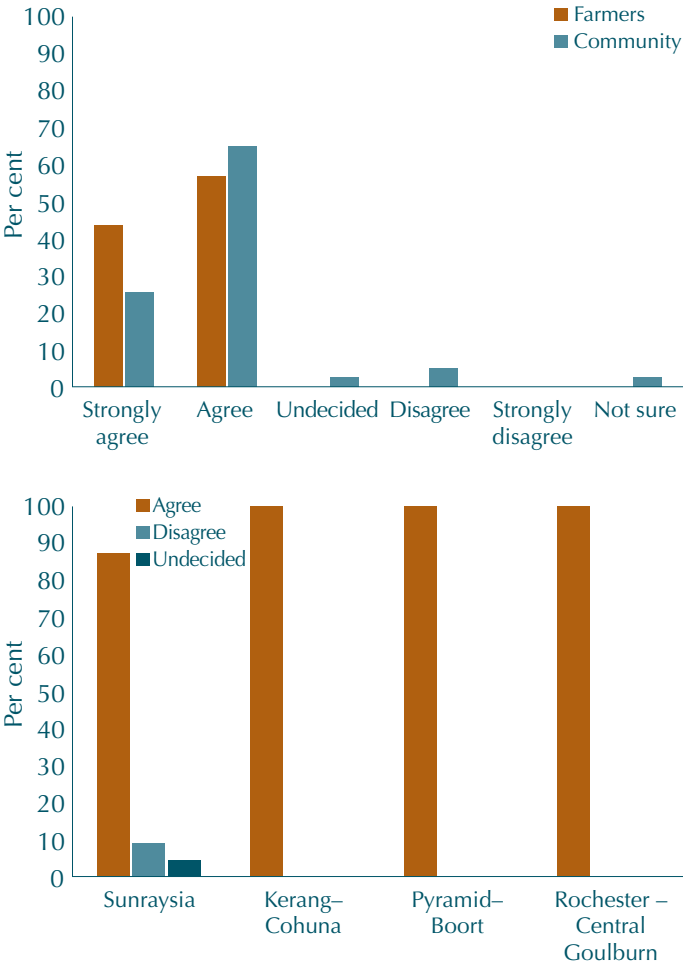
*‘Water trade should remain within this community’*

Sunraysia respondents were significantly more likely to disagree than respondents in other regions ( $\chi^2=8.989$ ,  $p<0.03$ ). As one said, ‘You will never have water trade if you can’t trade out of the district’. People in Rochester, Central Goulburn and Pyramid–Boort strongly agreed.



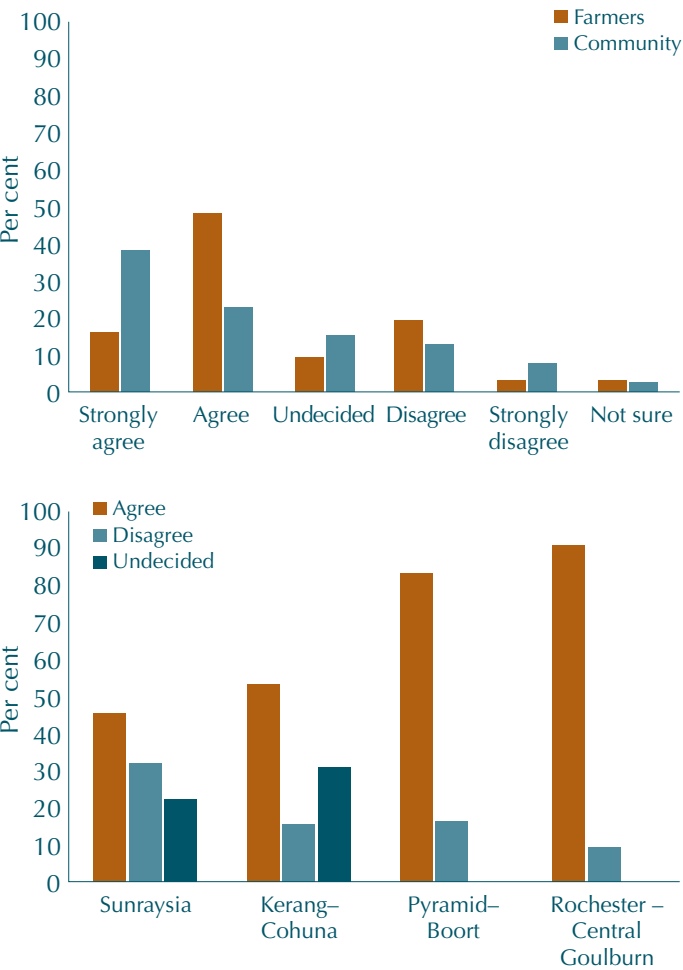
*‘Temporary water trade is a good thing’*

This statement invoked almost universal agreement, but farmers were significantly more likely to strongly agree than community members ( $\chi^2=3.985$ ,  $p<0.05$ ).



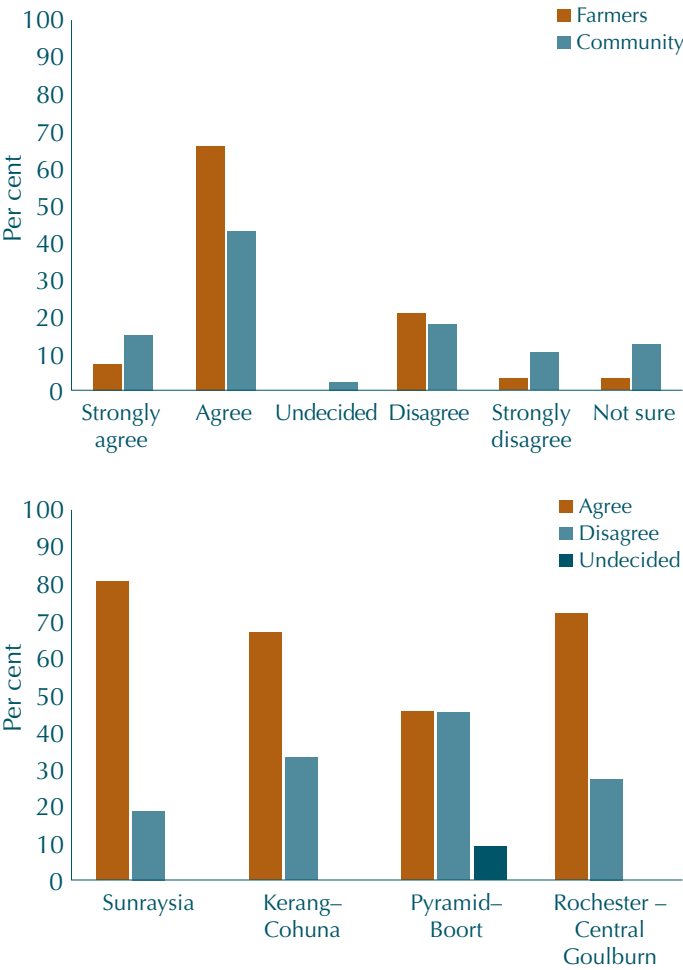
*‘Permanent trade is ruining farm communities’*

Participants in Sunraysia—who benefit most from the sale of permanent water—were significantly more likely to disagree with this statement than those in the remaining regions ( $\chi^2=7.968$ ,  $p<0.05$ ). There was more indecision in Kerang–Cohuna, where there has been a great deal of trade out of the region, yet clearly there is more acknowledgment of the benefits of permanent trading. One Kerang resident responded that it was changing rural communities rather than ruining them. Others noted the benefits for places such as Robinvale.



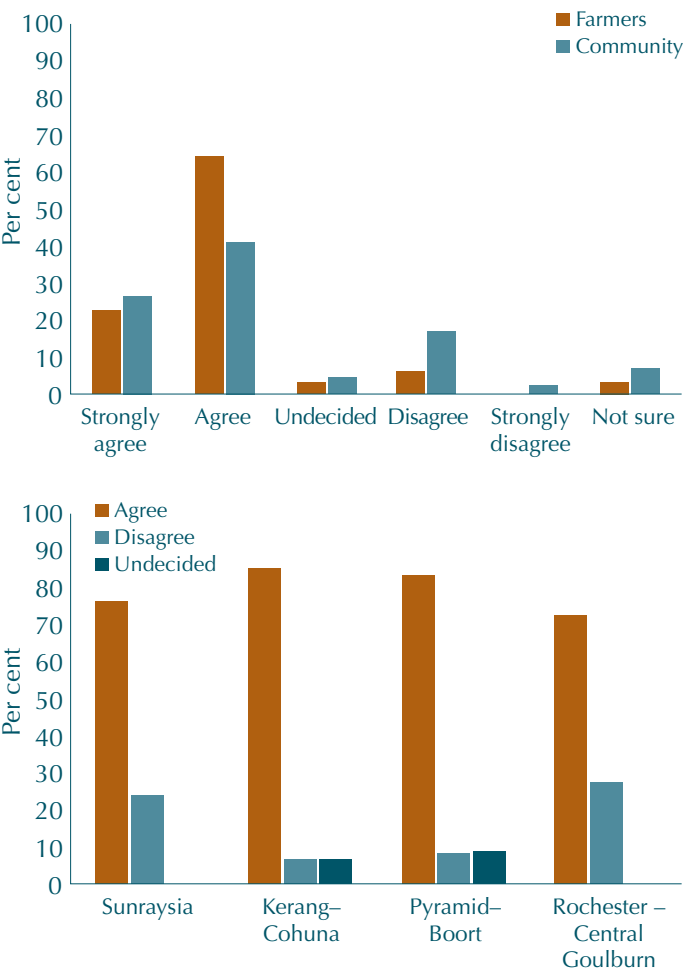
*‘Water trade has sped up some rural adjustment that was inevitable anyway’*

Although not significant, trends in the data show that Pyramid–Boort residents were less likely to agree with this statement. The inference in the statement invoked some strong reactions from respondents in Pyramid–Boort, where there had been a loss of farmers from the region. One respondent added, ‘There’s no such thing as inevitable!’



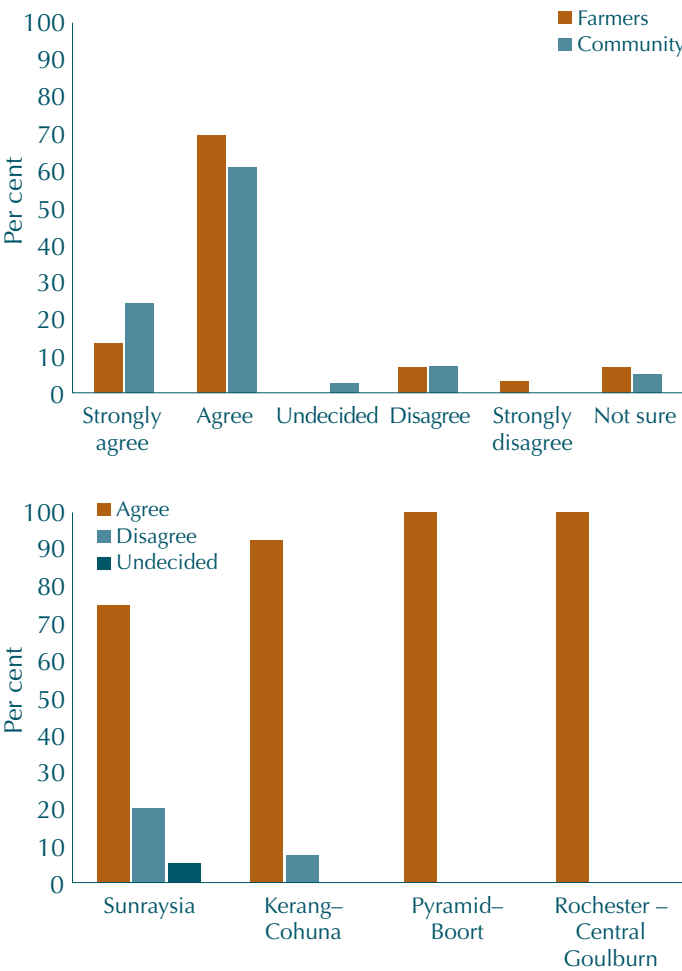
*‘Water trade has provided many farmers with a form of superannuation’*

There was general agreement with this statement.



*‘Water trade has enabled many farmers to leave farming’*

This statement elicited general agreement. One participant commented, however, ‘OK, it has given them an excuse to leave, but I wouldn’t say it has enabled them. You can always leave farming; you are not tied down with a bolt and padlock and, even if you were, you can cut it’.

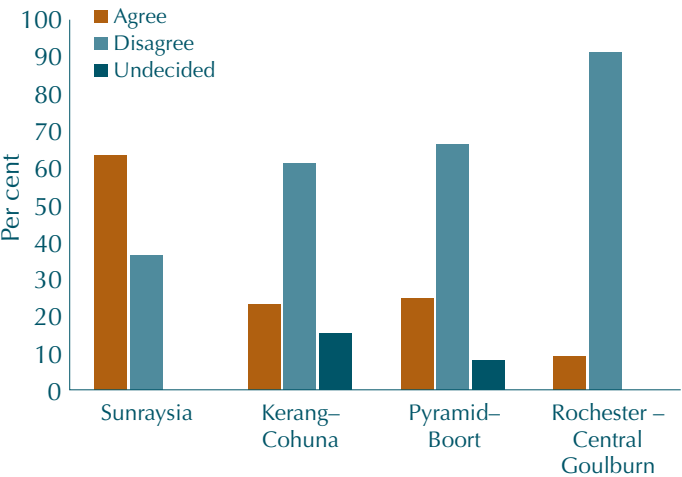
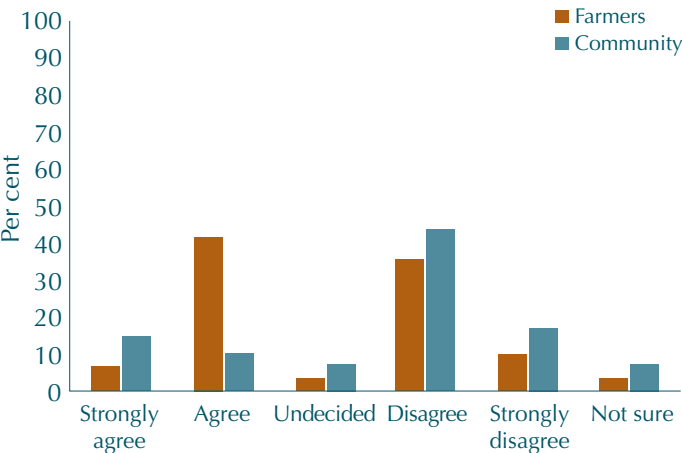




### ‘Water trade has brought a lot of jobs to this community’

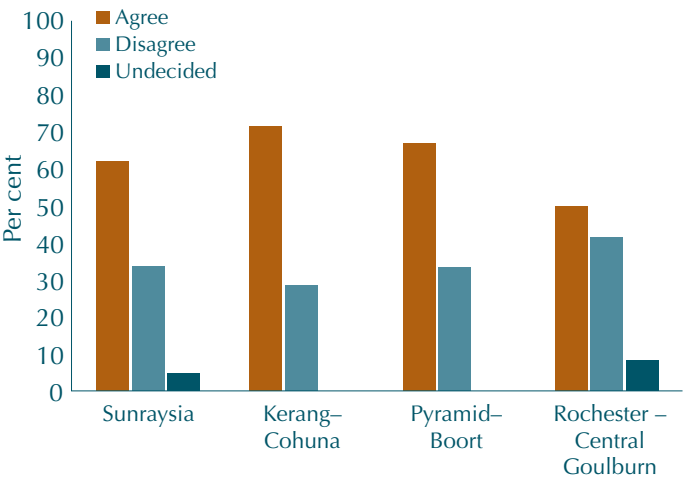
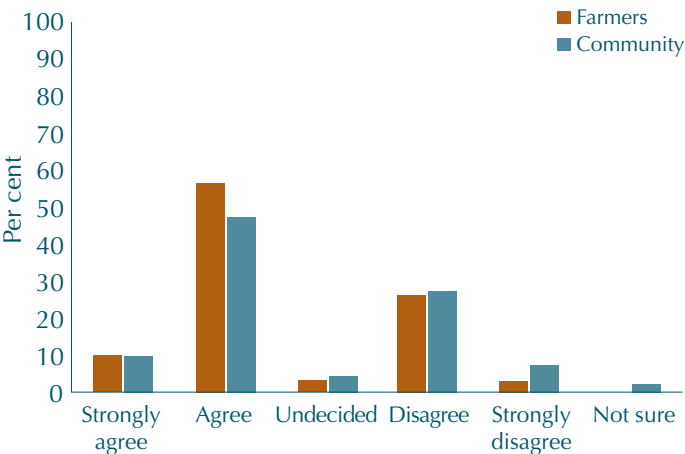
The responses to this statement reflected participants’ experience. Participants in Sunraysia, where there has been increased employment, were much more likely to agree with the statement than participants in the other irrigation districts ( $\chi^2=17.998$ ,  $p<0.0001$ ). One respondent commented:

*It’s created jobs for water brokers. Probably some jobs are brought in, but they are going to be short term. Once the farms become operational they will use less man-hours and the workers will need to be more highly skilled because all the machinery they use has to be driven or operated. There is no manual labour; you don’t pick almonds by hand.*



### ‘Water trade has increased the wealth of every farmer who owns water’

There was general agreement with this statement, although slightly more so in Sunraysia and Kerang–Cohuna than in other areas. Many respondents qualified their agreement by noting that wealth was increased ‘on paper’. One added, ‘It’s increased their asset value but if you take the water off a piece of land it’s probably reduced their other asset value—the land—so you end up with the same amount’.

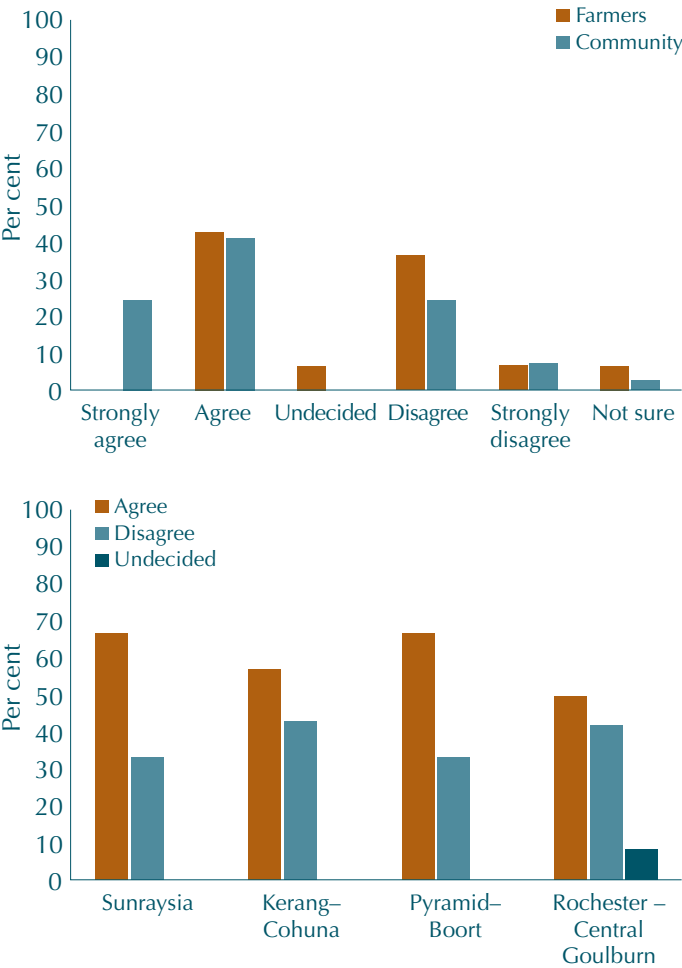


*‘Water trade will lead to all water being held by a few rich people’*

Community members were significantly more likely than farmers to agree with this statement ( $\chi^2=7.157$ ,  $p<0.01$ ). One said:

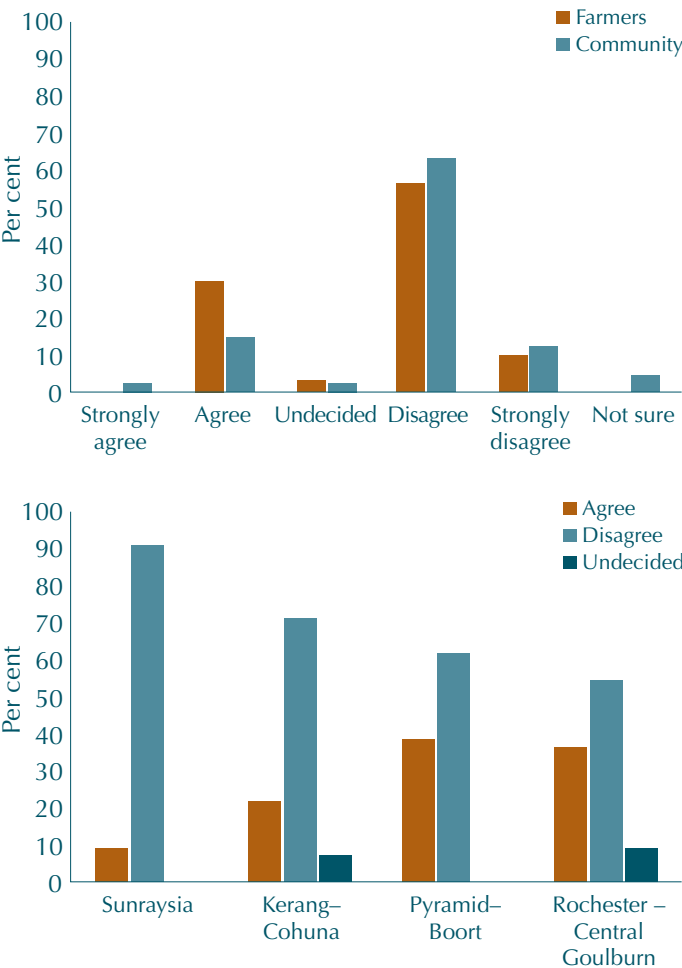
*What’s the one thing that we have the least of in Australia? Water. Those who hold all the water hold all the power. I’m fairly right wing but that is a left wing statement—way out there. But I don’t think it will happen because there is no one with that much money. But the government is having a go at it.*

Another agreed: ‘I’m inclined to agree, but I think that’s one of those unforeseen consequences that time will give you the answer. But I can certainly see it happening with more and more superannuation funds. Hopefully mine will be smart enough to buy up some water’.



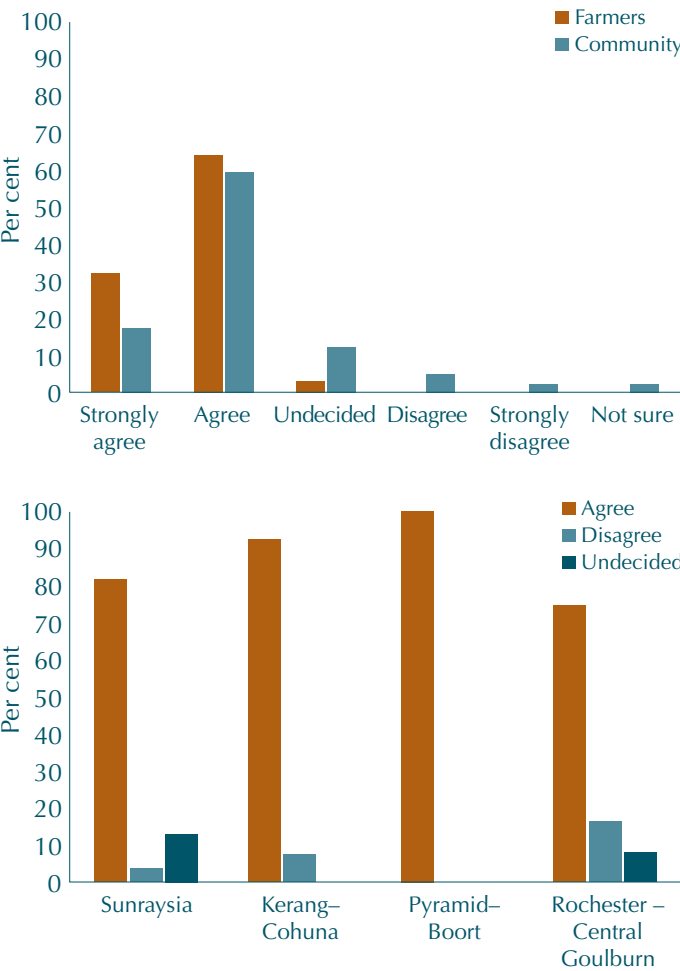
*‘Water trade has caused local businesses and schools to close’*

People tended to disagree with this statement. There was more agreement among those in Pyramid-Boort and Rochester – Central Goulburn, where several respondents referred to smaller communities that had lost teachers and schools. A Rochester resident explained, ‘Manilla’s a little community from here, concentrated dairying, with two or one or a half teacher school. The only thing that will keep that school open is hobby farmers that buy out dairy farmers when they can no longer go on’.



### ‘Water trade gives farmers flexibility in how they run their farms’

Significantly more farmers than community members agreed that water trading does provide flexibility ( $\chi^2=5.043$ ,  $p<0.02$ ). One community member qualified his response: ‘It’s another management tool but it’s not the number one management tool. I think they need water security more than water trade’. Another disagreed: ‘Either you’ve got water and you farm or you’ve got no water and you can’t farm. There’s no flexibility in that’.

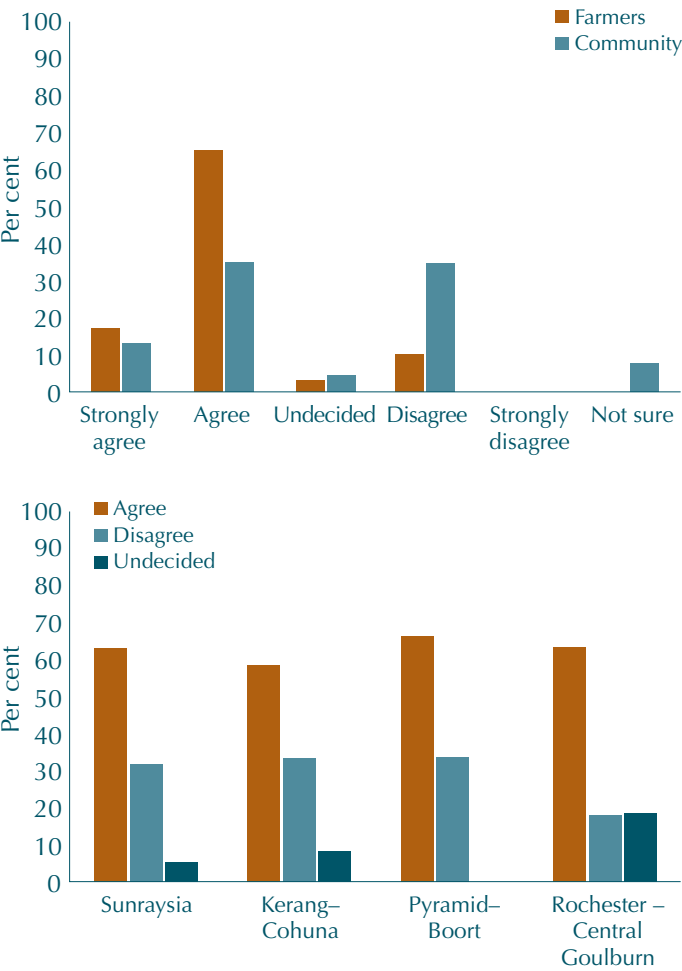


### ‘Water trade has helped farmers manage drought’

Participants were divided on this statement. Those who disagreed believed the trade enabled cash flow and debt management rather than drought management, as demonstrated in the following comments:

*No, it’s helped them manage income through the drought but not farming through the drought.*

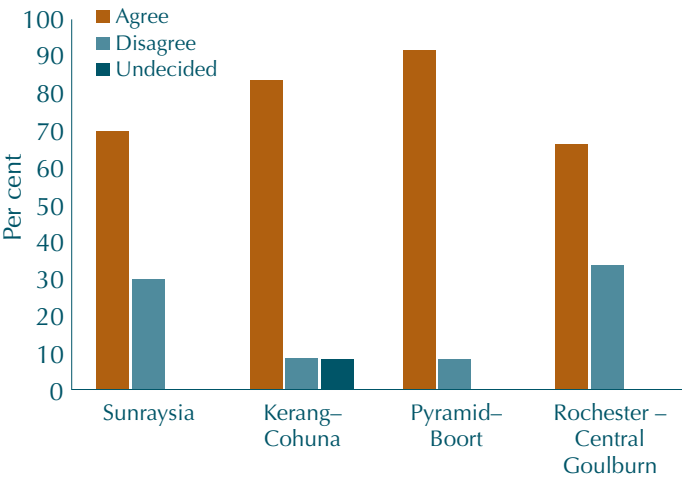
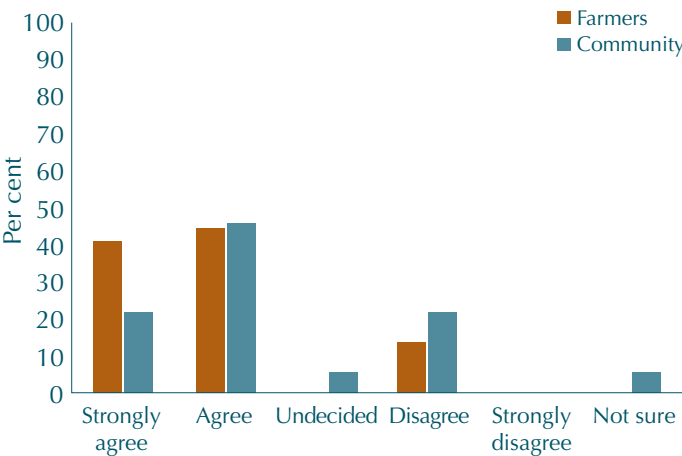
*Not in and of itself. It has managed to help their economic situation within a drought but that’s not managing drought, I don’t think. So not in the long term.*



Although there were similar patterns in the responses between regions, farmers were significantly more likely to agree with this statement than community members ( $\chi^2=4.985$ ,  $p<0.03$ ). This finding confirms some participants’ observation that people living in country towns often do not really understand what the farmers are going through with drought and low water allocations or the role that water trading plays.

*‘Farmers won’t be able to compete with cities for water’*

Significantly more farmers than community members agreed with this assertion ( $\chi^2=4.776$ ,  $p<0.03$ ). Some were aware of the relatively small amount of water used by regional cities compared with the amount used for irrigation.





## Appendix C: A brief history of water trading in Victoria

### The evolution of water trading

The ability to trade water in south-eastern Australia developed as a response to emerging pressures on the resource during the early 1980s. As the squeeze between competing uses for water—both from consumptive users and from those wishing to see more water allocated to the environment—and caps on supply began to be felt, attention turned from engineering solutions to the use of economic instruments to deal with the emerging scarcity problem.

There had been some informal trading before then, or people had found other ways around the inability to trade water that was tied to land—for example, farmers were buying land in less productive areas purely for the water right attached to the land, which they could then effectively transfer to their own land—but in the early 1980s some users and policy makers increasingly advocated the reallocation of water through trading.

In order to enable trading, jurisdictions progressively converted old forms of licensed entitlements to new, better defined, secure and tradeable entitlements. The main elements of this conversion have been the specification of entitlements with clearly defined volumes and reliability, separation of entitlements from land, and ‘unbundling’ of various components of entitlements such as the associated works and use approvals and delivery capacity.

The introduction of legislation and institutional arrangements formalising trade was a gradual process. Initially, trading was limited to particular locations and types of trades—in particular, to trading of annual allocations to allow farmers to top up or sell excess water for the remainder of a season. So-called temporary trading is the transfer of the water allocation for a particular season, particular seasons, or the remainder of a season, after which the buyer has no further claim on the water. Temporary trading thus entails trading in water that is available now, not the underlying entitlement to water in the future.

In contrast, permanent trading is the transfer of a water entitlement and hence all future allocations associated with that entitlement. It is known as a permanent trade because it involves not just the right to the current season’s allocation but the right to future seasons’ allocations as well.

A major impetus for the development of water markets in Australia was the 1994 national water reform agreed by the Council of Australian Governments as part of the broader National Competition Policy. The COAG agreement represented a watershed in the evolution of water allocation arrangements in Australia, away from administrative allocation by governments towards a market-based approach using clearly defined property rights.



Further impetus for water trading as a mechanism for efficiently reallocating water resulted from the implementation of limits on water diversions because of growing concern about the health of waterways. In 1995 an audit of water use in the Murray–Darling Basin concluded that the current level of extraction was not sustainable. In 1997 the Murray–Darling Basin Commission capped the level of extraction from the basin at the 1993–94 levels. A pilot interstate trading program was established in 1997. Further changes intended to promote open water trading will follow from the National Water Initiative agreed by the Commonwealth and state and territory governments in 2004. These include a partial relaxation of limits to trading of water entitlements between regions in the 2006–07 irrigation season.

## The water trading framework in Victoria

Bulk entitlements form the basis of the Victorian water rights system; they cover 95 per cent of the water used in agriculture in Victoria. Rural water authorities receive an aggregate of individuals' water rights and diversion licences. The role of the authorities is to supply the water entitlements to the end users.

There are two basic types of water entitlements in Victoria. Water rights are available for communally supplied irrigation districts and were tied to the title of land. Yearly allocations vary according to the storage level, and the rights have strict volumetric or share limitations. These rights are held in perpetuity. Private diversion licences on regulated streams control direct water extraction from waterways and aquifers. They are for a period not exceeding 15 years, with the assumption of renewal.

Victoria introduced temporary trading in allocations in 1989, permanent intra-district entitlement trade in 1991, and permanent inter-district entitlement trade in 1994. To date, volumes of temporarily traded water have far outweighed those of permanently traded water.

The permanent trade has been regulated in order to stop large volumes of water moving out of regions in a single irrigation season. Until 2006–07 only 2 per cent of water entitlements

held in a region could be traded out in a given year. For the 2006–07 irrigation season the limit was raised to 4 per cent. The limit has led to permanent trade being suspended in a number of years when the 2 per cent had been reached. In some cases the limit is met very early in the irrigation season (as in Central Goulburn in 2005–06) or even before the season begins if enough applications to trade water entitlements are lodged (as in Pyramid–Boort in 2004–05). Table C.1 shows details of suspensions.

In Victoria ownership of water rights has been restricted to people who own or occupy land and have access to individual water entitlements. The Government's 2004 White Paper proposed loosening the nexus between water and land. From 1 July 2007 non-users of water will be able to buy water, but this will be limited to 10 per cent of the maximum volume of entitlement (for water shares of that class) in the particular water system.

Victoria is also moving forward with the unbundling concept by separating out the different elements of water entitlements into the separable rights. The date for implementation of the unbundling is now 1 July 2007. This will separate existing water rights into three components: a water share, a water use licence, and an allocation account. In order to manage this change, and to manage potential third party effects of water trades on the reliability of supply between different irrigation systems, the market rules were changed during the 2006–07 irrigation season (see box). One possible explanation for the significant movement of water entitlements from the Goulburn system to the Murray system observed in the past three years may be to gain advantage before the new rules take effect.

There are also rules regulating temporary water transfers. For example, limits are placed on the volume of water that can be back-traded up the Goulburn River because of the hydrological restrictions on such water movements. Under the current framework, there are limits on back-trade for the Murray-to-Goulburn allocation trade: 'If the total volume of applications received [to back-trade water from the Murray to the Goulburn system] exceeds the available trading opportunity, we [Goulburn–Murray Water] will conduct a ballot to select the successful applications' (Goulburn–Murray Water 2006a).

**Table C.1: Suspensions of permanent trade**

District	Irrigation season	Date of suspension
Campaspe	2004–05	13 December 2004
Campaspe	2005–06	19 January 2006
Campaspe	2006–07	29 December 2006
Central Goulburn	2003–04	7 January 2004
Central Goulburn	2004–05	30 August 2004
Central Goulburn	2005–06	28 June 2005
Central Goulburn	2006–07	19 February 2007
Pyramid–Boort	2003–04	8 July 2003
Pyramid–Boort	2004–05	29 September 2003
Pyramid–Boort	2005–06	19 May 2005
Pyramid–Boort	2006–07	8 March 2007
Rochester	2003–04	12 March 2003
Rochester	2004–05	10 November 2004
Rochester	2005–06	27 March 2006
Rochester	2006–07	8 March 2007
Shepparton	2005–06	15 May 2006
Torrumbarry	2004–05	30 June 2004
Torrumbarry	2005–06	19 July 2005

Notes: Suspension is introduced after permanent trading for the irrigation season reaches the allowable limit for water entitlement leaving the region. If transfers of entitlement into the region reduce the net trade out to less than 2 per cent during the irrigation season, transfers out will be allowed until the 2 per cent limit is reached again. For example, Torrumbarry ended the 2004–05 season with a net transfer out of 1.86 per cent, despite trade being suspended (Rod Killmartin, Goulburn–Murray Water, pers. comm., 3 January 2007).

The allowable limit for 2006–07 was 4 per cent; for all other years it was 2 per cent.

Source: Goulburn–Murray Water media releases.

## Goulburn–Murray Water’s announcement on permanent water market rules

Goulburn–Murray Water made the following announcement on 20 December 2006:

*As of close of business 18 December 2006, permanent trading arrangements in Victoria will require a seller’s allocation of water to be at least equal to the allocation levels that apply in the buyer’s system, protecting other users in the system receiving the traded water.*

*The new condition on permanent trading in Victoria will ensure current allocations for all customers are secure. This change will no longer allow a shortfall in allocation when trading from the Goulburn, Campaspe and Loddon systems to the Murray system.*

*Under the previous rules, if 100ML of Goulburn entitlement (24% allocation) was permanently traded to the Victorian Murray system (95% allocation), the buyer received 95ML of allocation in the current season, while the seller only held 24 ML of allocation. The shortfall of 71 ML affects all users.*

*Traders will now have two options:*

- *Sellers can either “top up” their unused water to the allocation of the destination system prior to transfer, or*
- *Buyers can elect to surrender the shortfall volume.*

*This change will only affect transfers of permanent unused water entitlement between systems with differing allocations in the current season.*

Source: Goulburn–Murray Water (2006b).

## A statewide overview of water trading

Water trading in Victoria is most prominent in areas serviced by Goulburn–Murray Water and Lower Murray Water. This is the case for both permanent water trading (see Table C.2) and temporary water trading (see Table C.3). Water trading in the Southern Rural Water district is a great deal smaller in terms of the number of trades and the volume of water traded, and trading in the First Mildura Irrigation Trust and Grampians–Wimmera–Mallee Water regions is smaller again.

Water trading is restricted for transactions that reallocate water from above the Barmah–Millewa Forest (the Barmah Choke) to below it. A maximum of 8500 megalitres a day can pass through the Barmah Choke without causing flooding.

## Water trading within regions

Intra-regional water trades—trades between irrigators in the same industry (such as dairying in Rochester and Central Goulburn) or between irrigators that are in close proximity but produce different crops (such as mixed farms and horticulture in Boort)—reallocate water within a region. Permanent intra-regional trades are not restricted by limits such as the 2 per cent or 4 per cent limit because water entitlements are not moved out of the region. Table C.4 shows permanent intra-regional trades in Victoria for 1995–96 to 1997–98 and 2004–05 and 2005–06.

The trend shown in Figure C.1 for 2003–04 continued until 2005–06 (N Barr, pers. comm., 23 January 2007). Notably, this has continued the sale of water by parish regions dominated by dairy farms.

In the 1900s few parishes had a loss of water right greater than 2.5 per cent. The exceptions were some of the most salt threatened areas—near Pyramid Hill and the country between Kerang and Swan Hill. Temporary trading in particular precipitated some major shifts in water use, with some localities trading away up to 40 per cent of their water in some seasons.

**Table C.2 Permanent water trading in Victoria, 2004–05**

	Water traded within		Water traded in		Water traded out		Total water traded	
	No. of trades	ML	No. of trades	ML	No. of trades	ML	No. of trades	ML
Rural water authority								
First Mildura Irrigation Trust	2	61	2	7	26	981	30	1 049
Goulburn–Murray Water	364	16 115	1	200	180	25 908	545	42 224
Grampians–Wimmera–Mallee Water	2	40	–	–	–	–	2	40
Lower Murray Water	60	8 218	180	25 535	37	4 597	277	38 351
Southern Rural Water	31	1 467	–	–	–	–	31	1 467
Total	459	25 902	183	25 742	243	31 486	702	57 389

– Zero.

Note: Total for Victoria cannot be calculated by taking the sum of the rural water authority areas because this would double-count inter-regional trades.

Source: ABS (2006).

**Table C.3 Temporary water trading in Victoria, 2004–05**

	Water traded within		Water traded in		Water traded out		Total water traded	
	No. of trades	ML	No. of trades	ML	No. of trades	ML	No. of trades	ML
Rural water authority								
First Mildura Irrigation Trust	62	1 756	24	460	195	5 904	281	8 120
Goulburn–Murray Water	7 236	305 920	610	48 720	66	10 036	7 912	364 676
Grampians–Wimmera–Mallee Water	124	387	–	–	4	880	128	1 267
Lower Murray Water	591	31 058	158	9 097	397	40 523	1 146	80 678
Southern Rural Water	353	16 723	–	–	–	–	353	16 723
Total	8 366	35 5843	792	58 277	662	57 343	9 323	444 263

– Zero.

Note: Total for Victoria cannot be calculated by taking the sum of the rural water authority areas because this would double-count inter-regional trades.

Source: ABS (2006).

**Table C.4: Intra-regional trades in permanent water entitlements, Victoria, selected years**

Region	1995–96	1996–97	1997–98	2004–05	2005–06
Shepparton	197	339	219	286	405
Central Goulburn	370	421	419	355	4 792
Rochester	253	193	596	398	256
Pyramid–Boort	1 336	1 004	2 621	522	5 166
Broken River	15	190	261	–	128
Goulburn River	154	69	295	159	125
Loddon River	20	290	119	–	254
Goulburn system total	2 345	2 506	4 530	1 720	11 126
Murray Valley	218	488	363	315	1 676
Kerang–Cohuna	183	1 396	1 639	619	3 425
Swan Hill	606	131	2 069	248	392
Tresco	–	25	108	20	–
Nyah	25	–	73	31	46
Woorinen	–	–	32	46	65
Upper Murray	–	–	50	–	2
Mitta Mitta River	–	–	–	–	5
Kiewa River	80	–	25	–	150
Ovens River	171	193	95	2	153
Murray River	245	288		187	184
Murray system total	1 528	2 521	4 454	1 467	6 098
Campaspe district	70	–	–	–	329
Campaspe River	110	–	23	424	20
Campaspe system total	180	0	23	424	349
Total	4 053	5 026	9 007	3 611	17 573

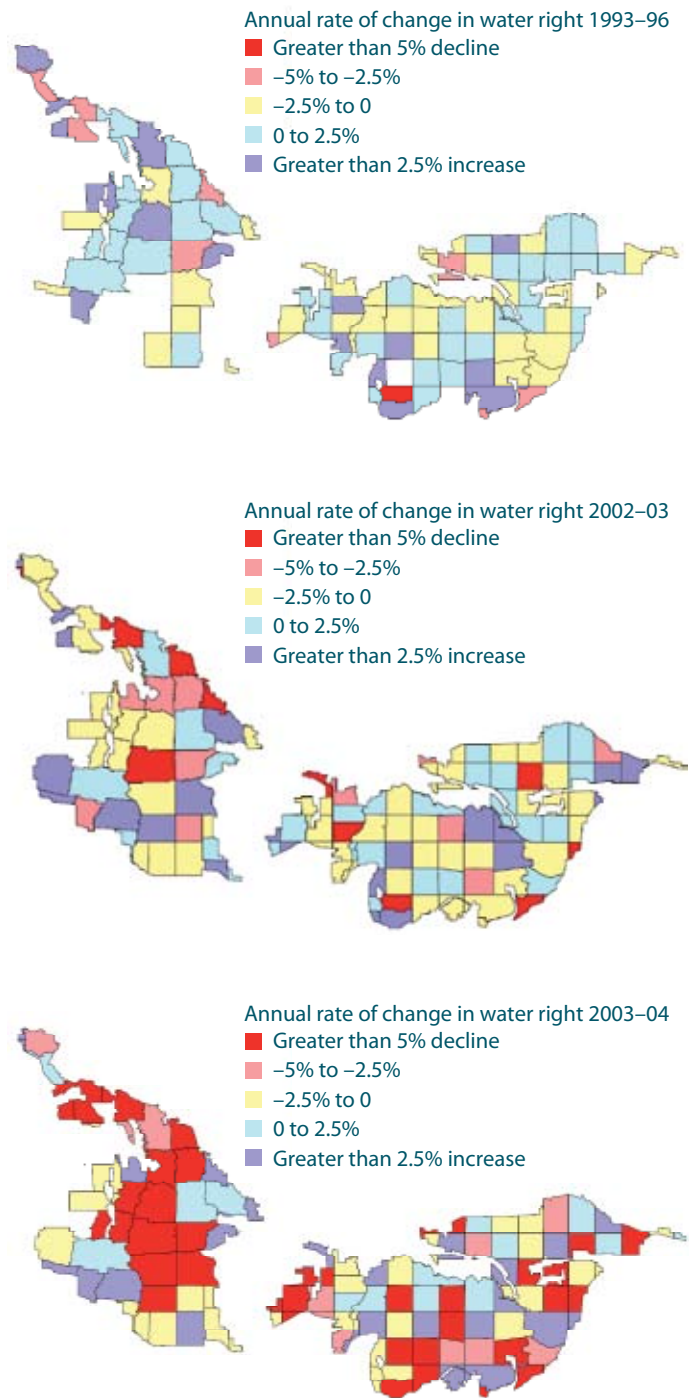
– Zero.

Source: Goulburn–Murray Water annual reports.



As noted, the 2 per cent limit that applied before 2006–07 meant that no more than 2 per cent of water entitlement held in a region could be traded out in a year. This does not, however, mean that only 2 per cent can be traded out of a given part of the region. In fact, the limit at the regional level can mask considerable variation in the distribution of water entitlements through reallocations via intra-regional permanent water trading. For example, in Pyramid–Boort and Kerang–Cohuna there are neighbouring red and blue zones, which represent significant water entitlement sales and purchases respectively.

**Figure C.1 Rate of change in water right ownership, by parish, Goulburn–Murray Water regions, selected years**





## Glossary

Extraction	The withdrawal of water from surface water or groundwater sources.
Carryover	The option to hold in storage a portion of unused seasonal allocations for use at a later date.
Consumptive use	The application of water to a use that typically diverts the water from its natural flow and permanently withdraws at least some of the water from the water source.
Conversion process	The process of converting water rights—such as take, use, divert and dam—from a previous water management regime to a form appropriate for new arrangements.
Delivery capacity share	A share of an irrigation supply channel's capacity or watercourse's capacity, specified as a percentage share or a volumetric supply rate at a particular time.
Dilution flow	A volume of relatively fresh water used to dilute polluted flows.
Entitlement	An entitlement to exclusive access to water in each irrigation season—a seasonal allocation—specified in volumetric terms or as a share of a specified consumptive pool.
Environmental manager	An agency with overall managerial responsibility for the achievement of environmental objectives.
Environmental flow	A water regime applied to a river, wetland or estuary to improve or maintain ecosystems and their benefits where there are competing water uses and where flows are regulated.
Environmental outcomes	Consequences for the environment—for example, maintaining ecosystem function, biodiversity, water quality and river health targets.
Externality	Occurs when a side-effect of a decision by an individual (or business) affects another party's wellbeing but that effect is not taken into appropriate account by the decision maker.
Fully allocated	Refers to situations where the total volume of water able to be taken by entitlement holders equals the environmentally sustainable level of extraction for that system.

Grandfathering	The process of granting water rights based on historical use of water or on the allocations of water rights in previous periods.
Groundwater recharge	The movement of water from the surface into a body of groundwater by percolation through the soil.
Home consumption price scheme	A mechanism of producer support that increases producer revenue by diverting supply from the less elastic domestic market to the export market.
Non-consumptive use	Water use such as hydro-electricity generation and in-stream environmental use that does not reduce the amount of water available to other users.
Non-point-source pollution	Pollution originating from many diffuse sources for which it is difficult to identify the precise source—for example, pollution linked to runoff from agricultural land.
Opportunity cost	The benefits forgone from the next best alternative use of a resource.
Over-allocation	Refers to situations where, with full development of entitlements in a particular system, the total volume of water able to be extracted by entitlement holders at a given time exceeds the environmentally sustainable level of extraction for that system.
Overland flows	Water that runs across the land after rainfall before it enters a watercourse, after it leaves a watercourse as floodwater, or after it rises to the surface naturally from underground.
Permanent trade	Trade in the underlying entitlement to continuing allocations of water.
Point-source pollution	Pollution originating from a particular and identifiable source—for example, a pipe or other conveyance.
Private diverter	An irrigator that directly extracts water from a main channel or river using their own infrastructure.
Pumped district	A district with shared infrastructure for delivering irrigation water to farms.
Reallocation of water rights	Reallocation decisions made by regional councils that alter the permissible water quantities available to consent holders—as opposed to the direct transfer of water rights between two water users, through trade, for example.
Return flow	The portion of extracted water that returns to the water system through seepage or runoff.
Seasonal allocation	A specific volume of water allocated to a water entitlement in a given season. Sometimes referred to as a water allocation, a water determination or a seasonal assignment.
Sleepers and dozers	Water entitlement holders who do not use any of or only partially use the amount of water they are entitled to.
Temporary trade	Trade in seasonal water allocations that involves transferring some or all of the water allocated to the entitlement for the current irrigation season, part of an irrigation season, or an agreed number of seasons.

Turbidity	A measure of water clarity and an indicator of the presence of suspended material such as silt and clay in water sources.
Unbundling	The separating of historic water entitlements that bundled water takes, land, water use, delivery and works approvals—for example, dams and intake and diversion gates—into separate entitlements or licences.
Voluntary transfer of water rights	The direct transfer of water rights between two water users—for example, through trade—as opposed to reallocation decisions made by regional authorities.





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- Campaspe (S)—Rochester (Statistical Local Area)
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- Greater Shepparton (C)—Part B West (Statistical Local Area)
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